SPHERON
CHANNEL BLACK
IN
GR-S STOCKS
Easy Processing
Low Heat Generation
ADEQUATE SUPPLIES
Godfrey L. Cabot, Inc.
BOSTON

Newsletter No. 9
SEPTEMBER, 1943

Published by Rubber Chemicals Division of DU PONT

Now Is The Time To Make High-Grade Products

THE time is fast approaching when synthetic elastomers will be produced in large quantities and will be available freely for many uses for which they could not be allowed previously. Rubber technologists will want to use them to make the highest quality items possible.

High-quality products can be made from neoprene. In the case of soles and heels, neoprene-carbon black compositions will, in severe service, outperform soles and heels made from any other elastomer including rubber. High grade neoprene soles may cost more per pair than those made of elastomer-reclaimed rubber mixtures, but they will be more economical in service by outwearing several pairs of other types of soles.

In the pre-war days before restrictions were placed on the use of rubber and synthetics, high carbon black-neoprene soles were used extensively on work shoes because they outwore leather and rubber soles in severe service. These service conditions not only involved oil, solvents and chemicals to which neoprene is conceded to be very resistant but also the crushed rock of railroad tracks and strip mines and coarse concrete of factories and garage yards. Such experience can only indicate that neoprene soles are of superior quality.

A high quality sole must wear well and resist cutting and chipping and also must flex without cracking across the ball of the foot or at the stitches throughout its service life. A good, well made neoprene sole of the proper hardness will do this. We recommend the compositions shown in Table I for high quality neoprene soles and heels.

TABLE I

Compound No.	721N-18 Neoprene Sole	1719N-11 Neoprene Heel
Neoprene Type GN	100.	100.
NEOZONE A	2.	2.
THERMOFLEX C	1.	—
Sodium Acetate	0.5	0.5
Stearic Acid	3.	1.
Extra Light Calcined Magnesia	4.	4.
Channel Carbon Black	80.	50.
Carbonex S	15.	—
Light Process Oil	—	12.
Dibutyl Sebacate	10.	—
Zinc Oxide	5.	5.
Factory Cure:	10 minutes at 316° F.	
Neoprene by Volume:	51.2%	63.4%

NOTE: Dibutyl sebacate was used in Compound No. 721N-18 to improve flexibility at sub-zero temperatures.

PHYSICAL DATA—10 MINUTES AT 316° F. CURE

Modulus at 300% Elong.—psi	1775	1675
Tensile Strength at Break—psi	2125	2775
Elongation at Break—%	460	500
Hardness—Shore Type A	83	68-70
Abrasion Resistance—du Pont Abrader (unaged * (CC Loss per Horsepower Hour)	74	170
Abrasion Resistance—du Pont Abrader —After Aging 7 days at 70°C.—Geer Oven	221	210
Abrasion Resistance—Corresponding Bureau of Standards Value†	100	100
Resistance to Flex Cracking (Hours Run on Sole Flexer)‡	110	‡
Low Temperature Flexibility—50° F. (SAE-ASTM Bent Loop Method	OK	
Specific Gravity	1.41	1.37

*The extremely low abrasion loss (74 cc) of the unaged neoprene sole may lie open to question but was obtained on repeated tests. It may be due to some kind of lubrication of the abrading surface though there was no evidence of smearing on the sandpaper discs used. It is probable that the abrasion loss (221 cc) on the aged sole more nearly indicates the true wearing resistance of the stock.

†Taken from conversion curve comparing du Pont and Bureau of Standards Abraders as shown in blue sheet report, BL-49.

‡At the end of 110 hours a sole made from the above formula was only slightly cracked at the stitches. For comparison an industrial rubber sole would show equal flex cracking in 40 hours when tested under similar conditions. No flexing tests were made on the heel stock since flexing is of negligible importance in heels.

Soles and Heels Made of Elastomer Reclaimed Rubber Compositions

Our recommendations for soles made with neoprene-reclaimed rubber and GR-S-reclaimed rubber are shown in our informal report BL-100, published May 15, 1943. Soles made from these recommendations are good but are, of course, inferior to the all-neoprene sole as is shown by a comparison of physical properties—see Table II.

TABLE II

	All Neoprene GN Carbon Black Sole 721N-18	Neoprene GN Reclaimed Rubber Sole 721N-3	GR-S Reclaimed Rubber Sole 721N-1
Neoprene by Volume—%	51.2	40.0	—
RHC from Reclaim by Volume—%	—	9.6	14.5
GR-S by Volume—%	—	—	35.0
Modulus at 300% Elong. psi	1775	1650	1475
Tensile Str. at Break psi	2125	1850	1525
Elongation at Break—%	460	415	305
Hardness—Shore Type A	83	90	88
Abrasion Resistance—du Pont Abrader (CC Loss per Horsepower Hour)	74	400	660
Abrasion Resistance—Corresp. Bureau of Standards Value	100	69	46
Resistance to Flex Cracking (Hours Run on Sole Flexer)	110	80	24
Low Temperature Flexibility— —50° F. (SAE-ASTM Bent Loop Method)	OK	OK	OK

DU PONT
RUBBER CHEMICALS DIVISION
BETTER THINGS FOR BETTER LIVING . . . Through Chemistry

INDIA RUBBER WORLD, September, 1943, Vol. 108, No. 6. Published monthly by BILL BROTHERS PUBLISHING CORP., 1309 Noble Street, Philadelphia 23, Pa. Editorial and advertising offices, 386 Fourth Avenue, New York 16, N. Y., U. S. A. Entered as second-class matter October 5, 1889, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879. Subscription, United States and Mexico, $3.00 per year; all other countries, $4.00; single copies, 35 cents.

New Facts on the use of M.R. in G.R.S. (Buna S)
WITCO M. R.
IN
GR-S (BUNA-S)
WITCO RESEARCH LABORATORIES
6200 W. 51st STREET CHICAGO 36 ILL.
WITCO
WISHNICK-TUMPEER, INC.
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New York 17, 295 Madison Avenue • Boston 9, 141 Milk Street
Tribune Tower • Cleveland 14, 616 St. Clair Avenue, N. E.
Foreign Office, London, England
Asphalt Company • Panhandle Carbon Company

New data on the effects of M.R. on the physical properties of GR-S products has been gathered after extensive tests by Wishnick-Tumpeer's laboratory and is now available in the booklet illustrated above—"WITCO M.R. in GR-S (BUNA S)."

Among the results that can be obtained with WITCO M.R. in a typical tire tread stock formula is *increased resistance to growth of cracks due to flexing.* In addition, the following results can be achieved:

Making the uncured stock more plastic and therefore easier to process

Increased tensile strength

Increased tear resistance

Decreased elongation obtained at break

Decreased effect of aging on lowering tensile strength, lowering elongation and hardening the cured stock

Decreased modulus

Increased tensile product

Decreased resilience

The booklet also presents information on the properties that may be obtained by using larger amounts of channel black and sulfur in conjunction with various amounts of M.R.

A copy of "WITCO M.R. IN GR-S (BUNA S)" is yours for the asking. Your request will receive our immediate attention.

WISHNICK-TUMPEER, INC.

MANUFACTURERS AND EXPORTERS

New York 17, 295 Madison Ave. • Boston 9, 141 Milk St. • Chicago 11, Tribune Tower • Cleveland 14, 616 St. Clair Avenue, N. E. • Witco Affiliates: The Pioneer Asphalt Company • Panhandle Carbon Company

Foreign Office, London, England

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ON THE LEVEL

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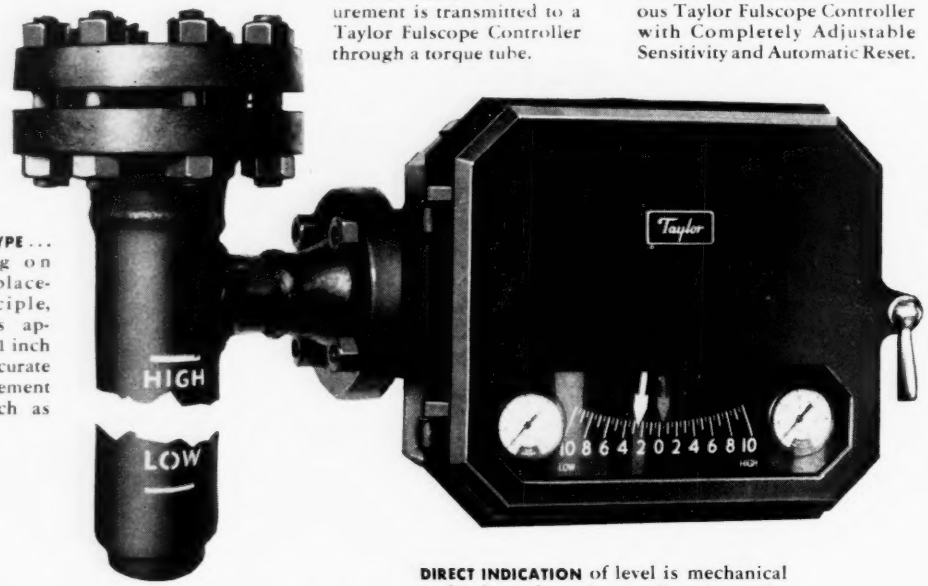
NO STUFFING BOX . . . Measurement is transmitted to a Taylor Fulscope Controller through a torque tube.

ALL THE ADVANTAGES of the famous Taylor Fulscope Controller with Completely Adjustable Sensitivity and Automatic Reset.

BUOYANCY TYPE . . . Operating on weight-displacement principle, float travels approximately 1 inch to give accurate level measurement over as much as 120 inches.



DIRECT INDICATION of level is mechanical and independent of controller air supply.

HERE'S a buoyancy type instrument that gives you not only *control* of level changes but *direct indication* as well! With or without Automatic Reset. A versatile, accurate instrument with *no stuffing box or internal pivots!*

1. Smooth, Throttling Control under the severest operating conditions as a result of Completely Adjustable Sensitivity (throttling range).

2. "Averaging" Liquid Level Control with minimum disturbances to process. Fully adjustable Automatic Reset restores level to optimum value.

3. No Stuffing Box—no pressure type bearings—measurement is transmitted through a torque tube. A sealed system *never* requiring lubrication or packing.

4. No Internal Pivots to cause friction or wear.

5. Level Indication is mechanical and independent of controller air supply.

6. Available as a Remote Pneumatic Transmitter to receiving indicators, recorders and/or controllers at a distant point.

7. Handles Liquids with specific gravities between .2 and 2.0.

8. Numerous Standard Ranges—14", 32", 60", 72", or 120".

9. Readily Adjustable to Changes in Specific Gravity. A convenient adjustment compensates for normal variations in sp.gr. Greater variations accommodated by changing torque tube and/or torsion spring.

10. Torque Tubes Interchangeable with those used in Taylor's new Aneroid Manometers—a real advantage to large users of instruments.

11. All Welded construction. Stainless steel used where essential.

12. Three-Position Alarm Devices available at slight additional cost. Suitable for hazardous applications.

Ask your Taylor Field Engineer for full details at once! Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada. *Instruments for indicating, recording, and controlling temperature, pressure, humidity, flow, and liquid level.*

ARMY NAVY

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ACCURACY FIRST
IN HOME AND INDUSTRY

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Reclaimed rubber and GR-S

Synthetic compounding made easier with proper use of reclaim

AS an aid to processing, reclaimed rubber has contributed a great deal to the easier handling of synthetic rubber. It has also proved that it can save power, and speed up mixing time.

In many cases, users have found properties of their compounds actually improved after heat-aging when reclaimed rubber has been added.

Philadelphia Rubber Works representatives will help you in the selection of the proper grades to answer your own GR-S compounding needs. These men have many ideas, based on their experience with wartime production problems. They invite your inquiries. The Philadelphia Rubber Works Co., Akron, Ohio.

Philadelphia
RECLAIMED RUBBER

When it's a battle against TIME—

You'll appreciate the SERVICE you get on SKELLYSOLVE!

● When you are bending every energy to meet an emergency order, one little hitch along the line can throw the whole operation out of gear.

That's why you will appreciate Skellysolve—and *Skellysolve Service. We get the goods to you when you need them*—special technical assistance, too—if you need it. Phone, write, or wire SKELLYSOLVE Division, address below.

Blitzkrieg from Below

A rock shot out of this Skelly Oil Well struck the steel crown block. The spark set off this explosion—caught by the camera before the fire reached the main column. Considered by many to be the most unusual photo of an oil well fire in existence. A split second later and the camera would have been too late.

(Reproduction from unretouched photo)

SKELLYSOLVE *in the* RUBBER INDUSTRY

There are six different types of Skellysolve which are especially adapted to various uses in the rubber industry, for making rubber cements, and for many different rubber fabricating operations. Skellysolve offers many advantages over benzol, rubber solvent gasoline, toluol, carbon tetrachloride, etc. It will pay you to investigate Skellysolve. Write today.

SKELLY

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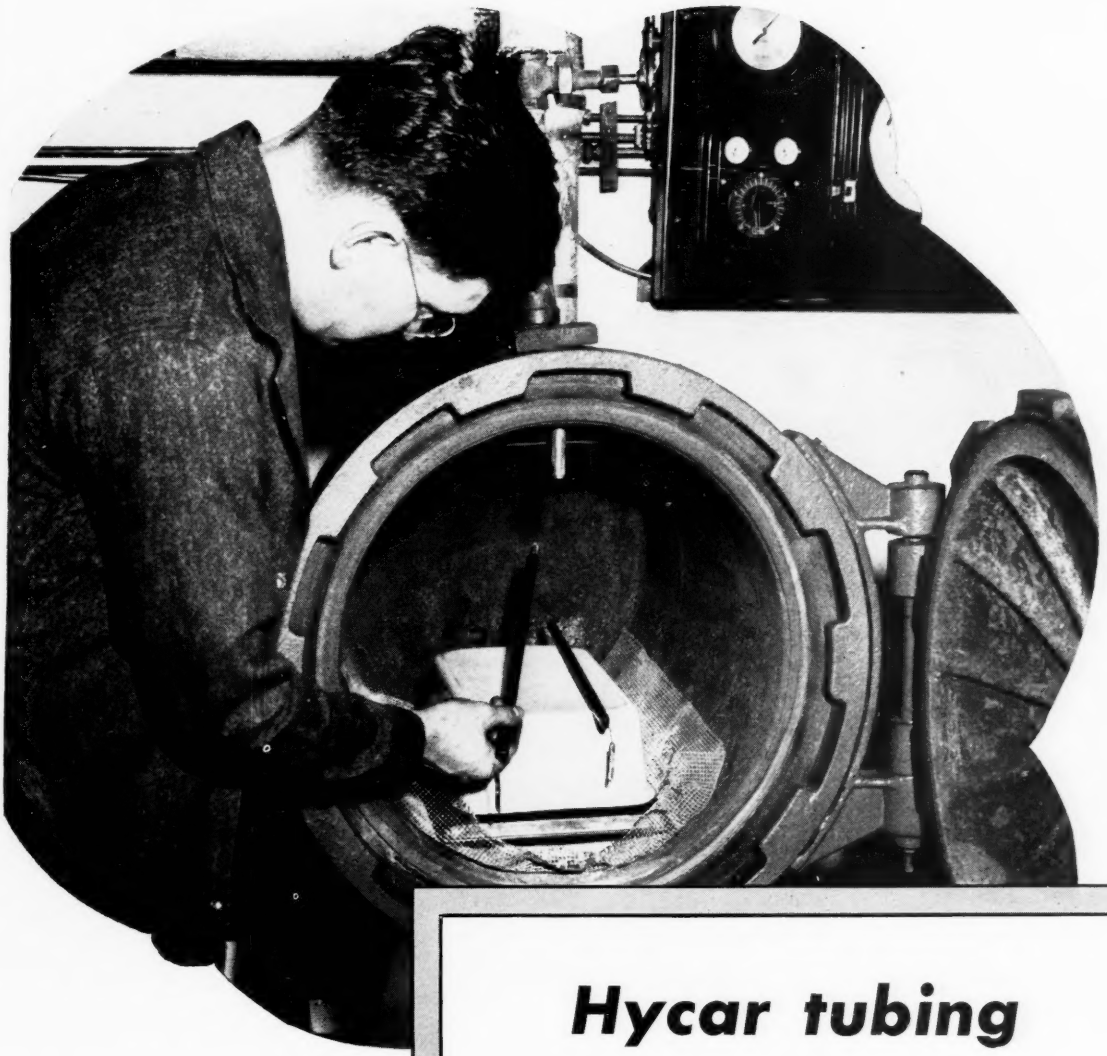
SOLVENTS DIVISION, SKELLY OIL CO.
SKELLY BLDG., KANSAS CITY, MO.



Hycar tubing takes the cure

Hycar

LARGEST INDEPENDENT PRODUCER OF BUTADIENE *Synthetic Rubber* IN AMERICA

IN this picture laboratory samples of Hycar tubing are being placed in an autoclave for an open-steam cure at the Hycar Customer Service Laboratory.

There's nothing unusual about the process, but there are some distinctly unusual things about the results that this laboratory produces for synthetic rubber fabricators.

Whatever the problem, open-steam or press cures, tubing, calendering, compounding or testing, Hycar's wealth of experience and special abilities in synthetic rubber are *your* shortcut to the answer.

The complete facilities of this laboratory and its trained personnel are at your service. We urge you to take full advantage of them. *Hycar Chemical Company, Akron 8, Ohio.*

TITANOX holds the Key
To White Pigment Satisfaction
Whiteness and brightness still are the outstanding characteristics of TITANOX pigments. In addition they have high tinting strength. They are chemically stable in the presence of acids, alkalis and gases. They are chemically inert and highly resistant to after-yellowing.
Only titanium pigments, of which TITANOX pigments are the oldest and most widely used, possess all of these qualities.
TITANOX pigments may be depended upon to give unsurpassed results in the compounding of natural, reclaimed and synthetic rubber in which white pigments are used.
TITANIUM PIGMENT CORPORATION, Sole Sales Agent
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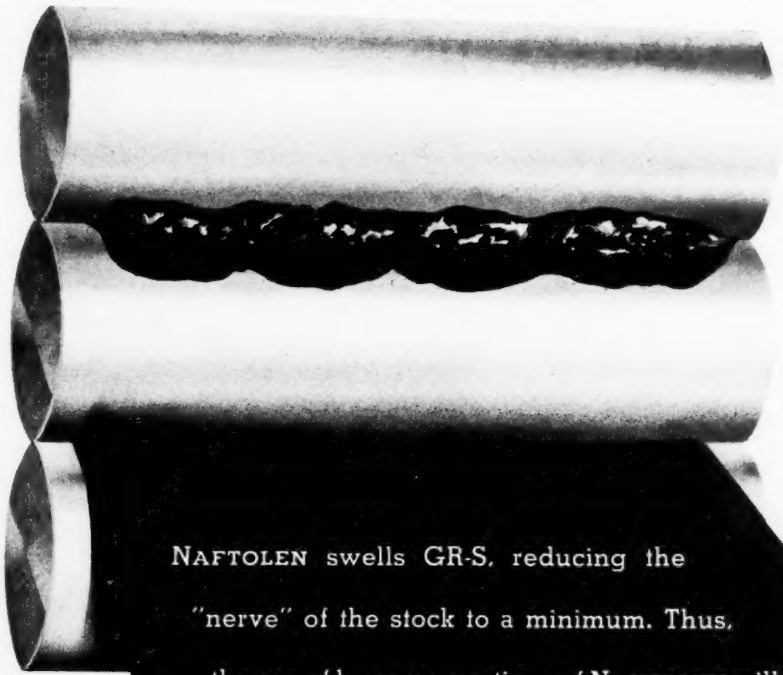
TRADE MARK

NAFTOLEN . . . *the* solution to your GR-S Calendering Problems



NAFTOLEN swells GR-S, reducing the "nerve" of the stock to a minimum. Thus, the use of large proportions of NAFTOLEN will result in a soft, tacky stock that can be calendered without difficulty. For this purpose we recommend 50 parts or more of NAFTOLEN for every 100 parts of GR-S. NAFTOLEN is an unsaturated hydrocarbon, and therefore proper sulfur adjustment is necessary for optimum results.

WILMINGTON CHEMICAL CORPORATION

10 East 40th Street, New York 16, N. Y.

Plant and Laboratory: Wilmington, Delaware

W
C=C
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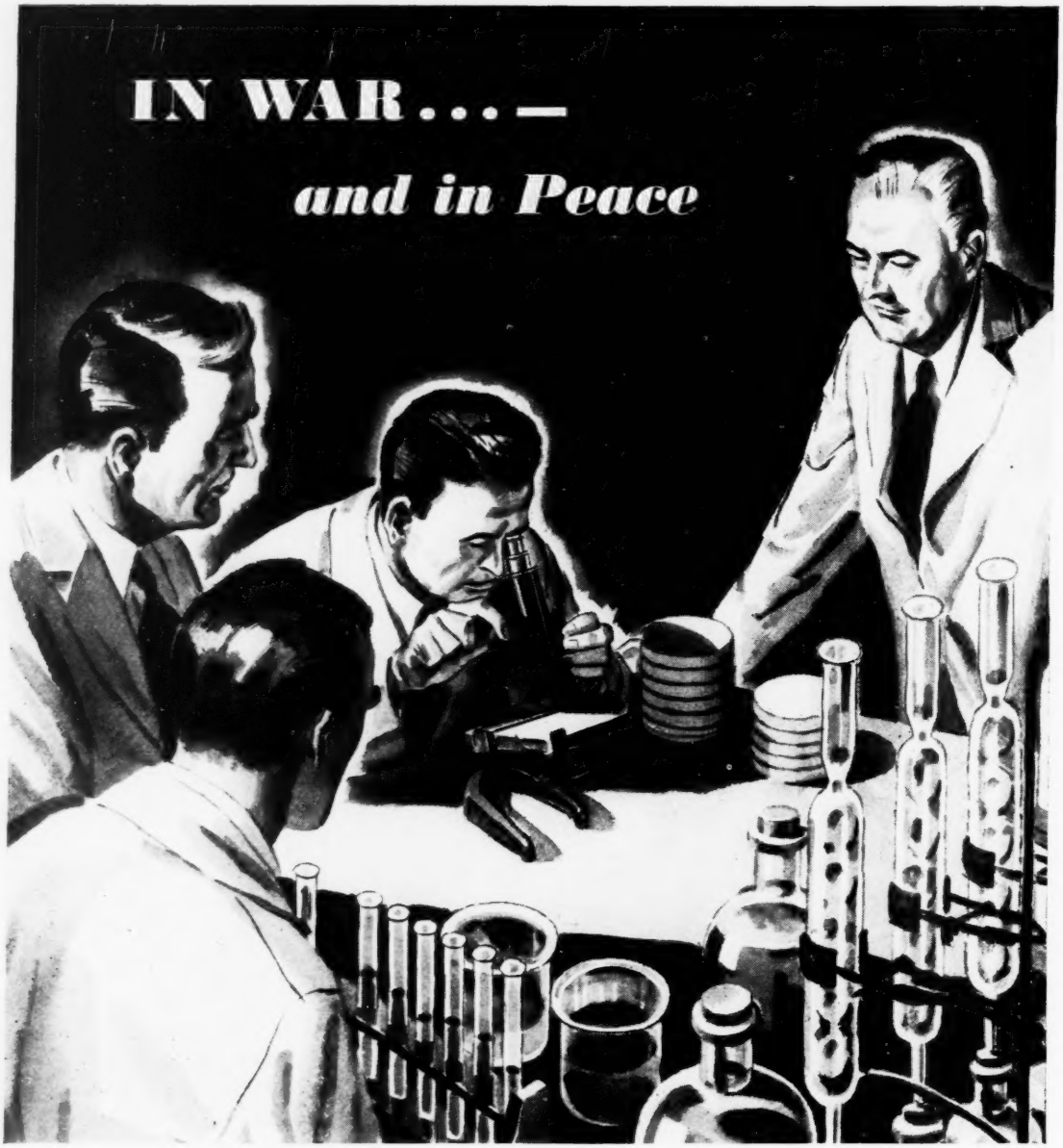

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For today's (or tomorrow's) production problems call on these experts . . . often!

Warwick Chemical Company

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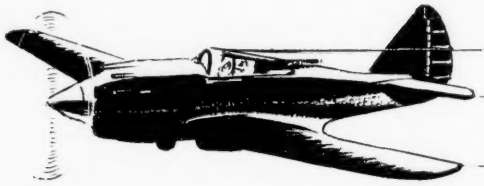
Metallic Stearates • Metallic Resinates • Sulfated Oils • Impregnole Water Repellent • Textile Compounds • Synthetic Detergents • Cation Active Compounds • Wetting Agents • Luminous Pigments



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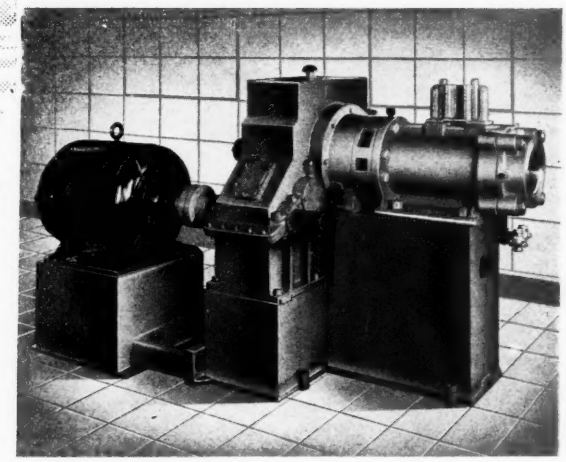
AS THE MODERN AIRPLANE IS FOR FLYING

ROYLE EXTRUDERS
FOR EVERY PRODUCTION PURPOSE



Let's Work and Fight for
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Every part of an airplane engine constructed to fulfill perfectly its function producing unfailingly dependable power.

For exactly the same reason Royle Extruders have been designed and built to exact specifications with tolerances as close as an airplane engine, to meet the extrusion requirements of the rubber industry.

Royle Extruders are a factor in war production. They will, as in the past, serve adequately the purposes of peace-time production, for world reconstruction.

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HERE ARE **10** PRACTICAL REASONS FOR USING

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THE VERSATILE SYNTHETIC RESIN

1. Similar carbon-hydrogen ratio to rubber
2. Imparts very desirable "tack" to natural rubber, and to certain synthetic rubbers including polybutene and butadiene-styrene types
3. Highly desirable ingredient for rubber cements prepared in solvent form, or in emulsion form for latex types
4. Soluble, in dilute solutions, in light rubber petroleum solvents such as ligroin, pentane, and hexane
5. Does not markedly increase the hardness of the stock
6. It is useful in supplying to synthetic rubbers, a thermo-plastic ingredient similar to the rubber resins in natural rubber
7. Aids breakdown in compoundnig the GR-S stocks
8. Non-toxic (proved by both animal feeding tests and the poisons analyses)
9. Its hydro-carbon nature means:
   a. Practically no acid or saponification number
   b. Available in various melting points from 10 to 115°C.
   c. Non-yellowing
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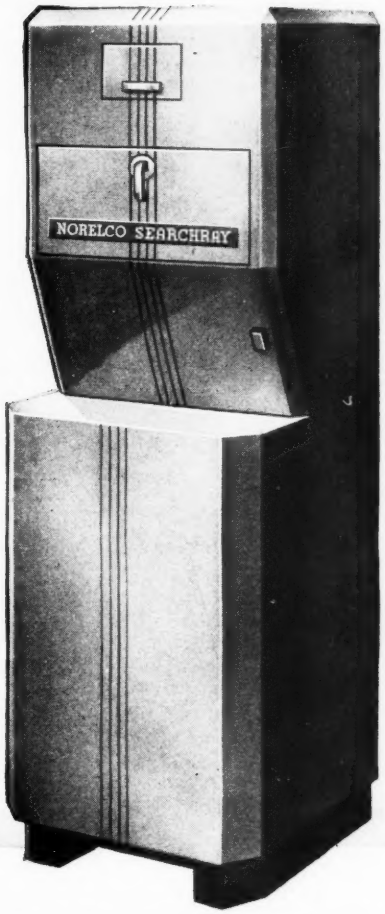
Sole representatives in the rubber industry
STANDARD CHEMICAL COMPANY, Akron Savings & Loan Bldg., Akron, Ohio

Meet

SEARCHRAY

INDUSTRY'S X-RAY HANDY MAN



Flaws you never suspected—defects that cause failures later on—show up in a flash when you put your product into the new "Norelco" Searchray.

Shockproof, rayproof, foolproof and readily mobile. Searchray is so simply devised that anyone can operate it. Yet it discloses in fluoroscopic and radiographic views the internal structure of parts, sub-assemblies and finished products and many other units made of light alloys, rubber, ceramics, plastics and other light materials. It can be as useful in the laboratory as it is on the production line.

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Factories in Dobbs Ferry, N. Y.; Mount Vernon, N. Y. (Philips Metalix Corp.); Lewiston, Maine (Elmet Division).

There's a Job ahead, Mr. Rubber Manufacturer!

. . . and you can put this Product...

out in front for your GR-S Compounding

because it will contribute vital help on *that job* by providing quick dispersion of sulfur, accelerator and pigments—and by assuring better performance in the finished products.

Manufactured by Pennsylvania Industrial Chemical Corp.

STANDARD

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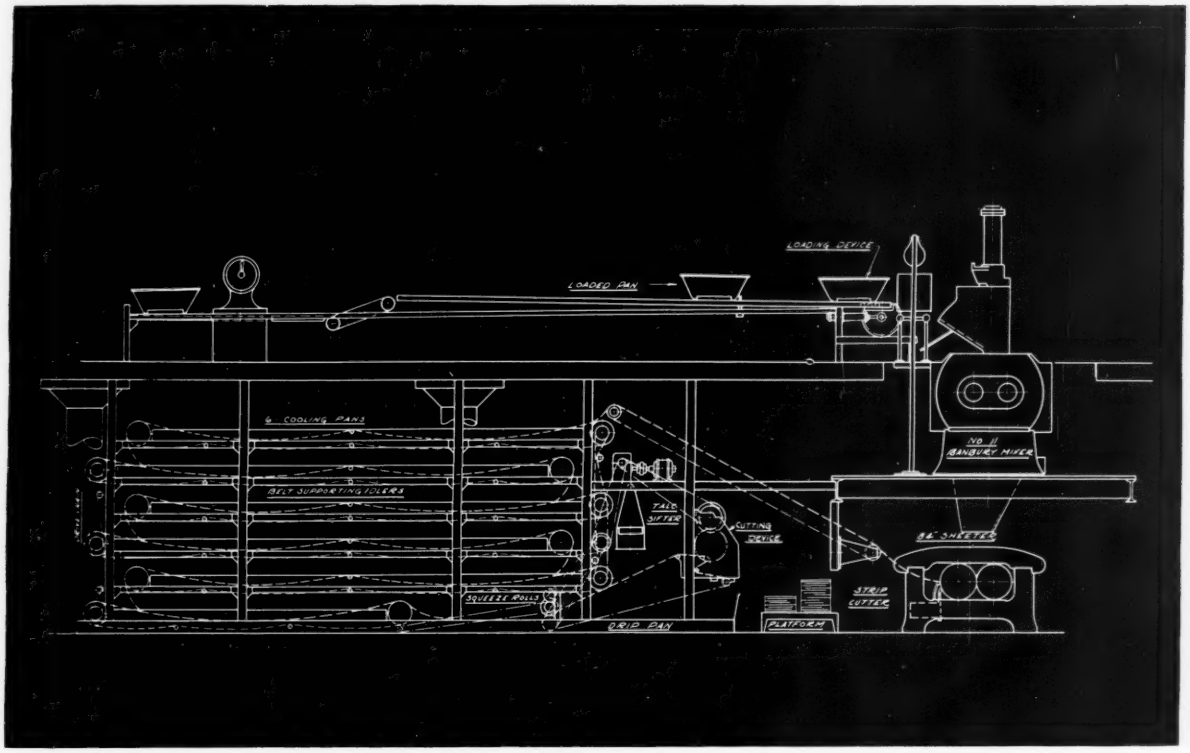

Ask for the Engineering that goes with each F-B machine

WHEN you need a new piece of processing equipment—a Banbury Mixer or a sheeting mill or a calender, for example—don't just order it by name and size. Instead, tell us what your problem is, and give us a chance to study the layout and make recommendations. In other words, "Ask for the engineering that goes with each F-B machine."

FOR EXAMPLE

Say that you need a Banbury with equipment for handling the stock to and from the mixer. The above drawing shows a Banbury with automatic feeding device, an 84" sheeting mill, cooler, and cutter for cutting the stock to length. This layout is typical for this type of installation but variations are sometimes required to meet existing conditions in an individual plant.

Although the Banbury is invariably mounted directly over the sheeting mill in modern installations, it may be advisable to provide different means of handling the stock, change the location of the cooler and stock cutter, etc. Every installation should be considered individually from an engineering standpoint as there are usually some special conditions which require consideration.

A WAY TO SAVE MONEY

In the long run you may save considerable money, as well as many future headaches, by calling in our engineers when your plans are still in the "thinking" stage. Ill-selected equipment has to be removed sooner or later to make way for an efficient layout. There is no charge and no obligation when you ask our engineers for advice.

PROCESS EQUIPMENT for RUBBER and PLASTICS

F-B PRODUCTION UNITS

Banbury Mixers—Plasticators—Pelletizers—Mixing, Grinding, Warming and Sheeting Mills—Bale Cutters—Tubing Machines—Refiners—Crackers—Washers—Calenders—Hose Machines—Hydraulic Presses—and other rubber working equipment.

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Plants: Ansonia and Derby, Conn., Buffalo, N. Y. — Branch Offices: New York, Buffalo, Pittsburgh, Akron, Los Angeles

BUCA

A New Pigment for Compounding All Types of Synthetic Rubber!

GR-S	100.
Sulfur	2.5
Cumar MH 2½	5.
Zinc Oxide	5.
Stearic Acid	1.
Captax	2.
BUCA	100.

Cure 40 lb. Steam 287° F.

	TENSILE	ELONGATION	MOD. @ 300%
15 Minutes	1208	825%	370
30 "	1649	725	419
45 "	1858	687	472
60 "	1836	675	474
75 "	1813	675	493

MIXED AS FOLLOWS: Masterbatch was made up with some GR-S, Sulfur and Cumar MH 2½ mixing at 200° F. Allowed this to rest for 24 hours and mixed with the rest of the GR-S. Pigments and accelerator were added in the usual manner.

MOORE & MUNGER

33 RECTOR STREET

NEW YORK

How to improve GR-S resilience

Manufacturers are incorporating Bardol,* a coal-tar chemical, in GR-S (Buna S), compounds to improve resilience and provide low hysteresis. Shown by tests to be compatible with GR-S, Bardol acts as a wetting agent and effective plasticizer. It processes readily and promotes dispersion of sulphur and accelerators in the elastomer, improving performance of the compounds.

Bardol may also be used effectively to improve:

- **Resistance to abrasion.**
- **Tensile strength and elongation.**
- **Flexibility at low temperatures and resistance to ply separation.**
- **Low permanent and compression set.**

For complete details, wire or write

THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK

Barrett

*Reg. U. S. Pat. Off.

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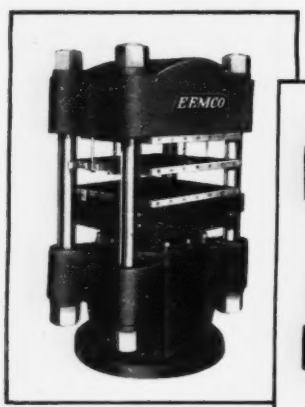
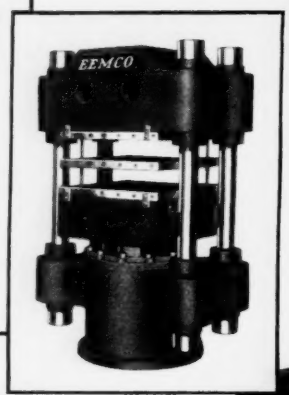
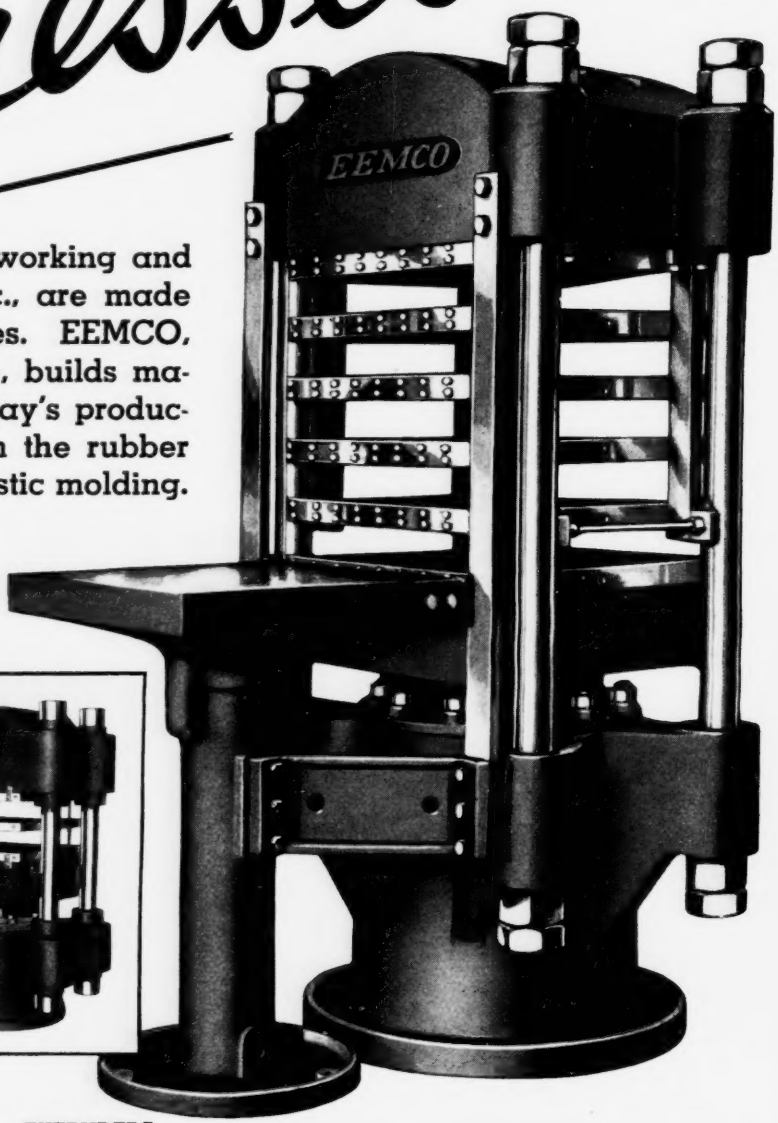
Presses

Presses for rubber working and plastic molding, etc., are made by EEMCO in all sizes. EEMCO, successors to Nagle, builds machinery to meet today's production requirements in the rubber industry and for plastic molding.







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STRAINERS - HYDRAULIC PRESSES
CALENDERS - CRACKERS - WASHERS

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EEMCO ERIE ENGINE & MFG. CO.

SUCCESSOR TO "NAGLE"

953 EAST 12th ST., ERIE, PENNA.

USE UNITED BLACKS FOR BEST RESULTS

Kosmobile 77-Dixiedensed 77 is the dustless easy processing channel black (EPC) for natural and synthetic rubber. Take advantage of its relatively low power consumption and cool mixing, easy and smooth processing, fast curing, top reinforcement, high rebound, low heat build-up, and dependable performance under all sorts of demands.

Kosmobile 77-Dixiedensed 77 is *the* black for tires. Employ it where your cardinal specifications call for toughness, hardness, and resistance to deterioration by generated heat, abrasion, flexing, and cracking.

Kosmobile 77-Dixiedensed 77 is produced under exacting conditions and carefully controlled for quality and uniformity. To repeat, "Use United blacks for best results."

UNITED CARBON COMPANY, INC.

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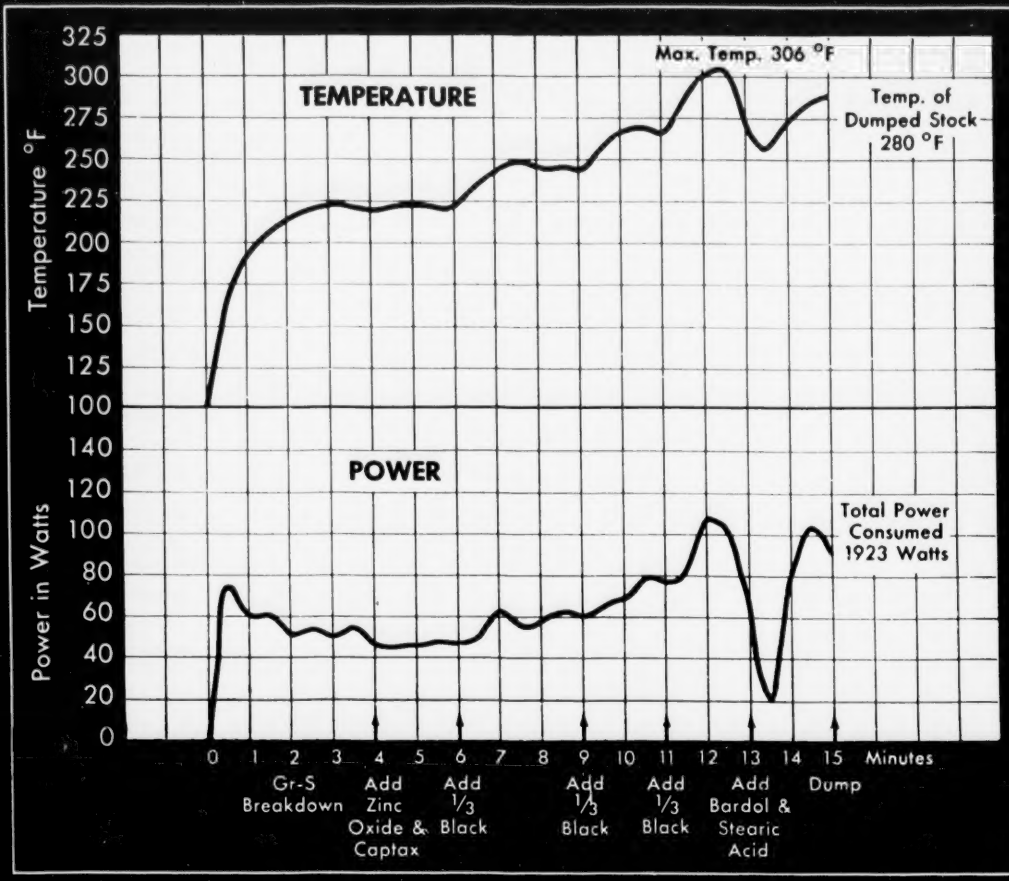
BEHAVIOR OF UNITED BLACKS IN GR-S (BUNA-S) TREAD STOCK IN A BANBURY WITH KOSMOBILE 77–DIXIEDENSED 77



RECIPE

Prem. Gr-S	100.0
Zinc Oxide	5.0
Captax	1.5
Kosmobile-"77"-Dixiedensed-"77"	50.0
Bardol	5.0
Stearic Acid	1.5
Sulphur	2.0

BANBURY CONDITIONS

Batch Size, Grams	1200
Cooling Water	100 °F
Water Pressure Lbs.	15
Speed R. P. M.	
Front Rotor	115
Rear Rotor	102
Ram Pressure Lbs. P. S. I.	100

NOTE:
Sulphur Added on Sheeting Mill

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This graph speaks for itself. The moderate temperature rise and relative low power consumption, observed in this graph, would be even more pronounced where natural rubber is used with Kosmobile 77-Dixiedensed 77.

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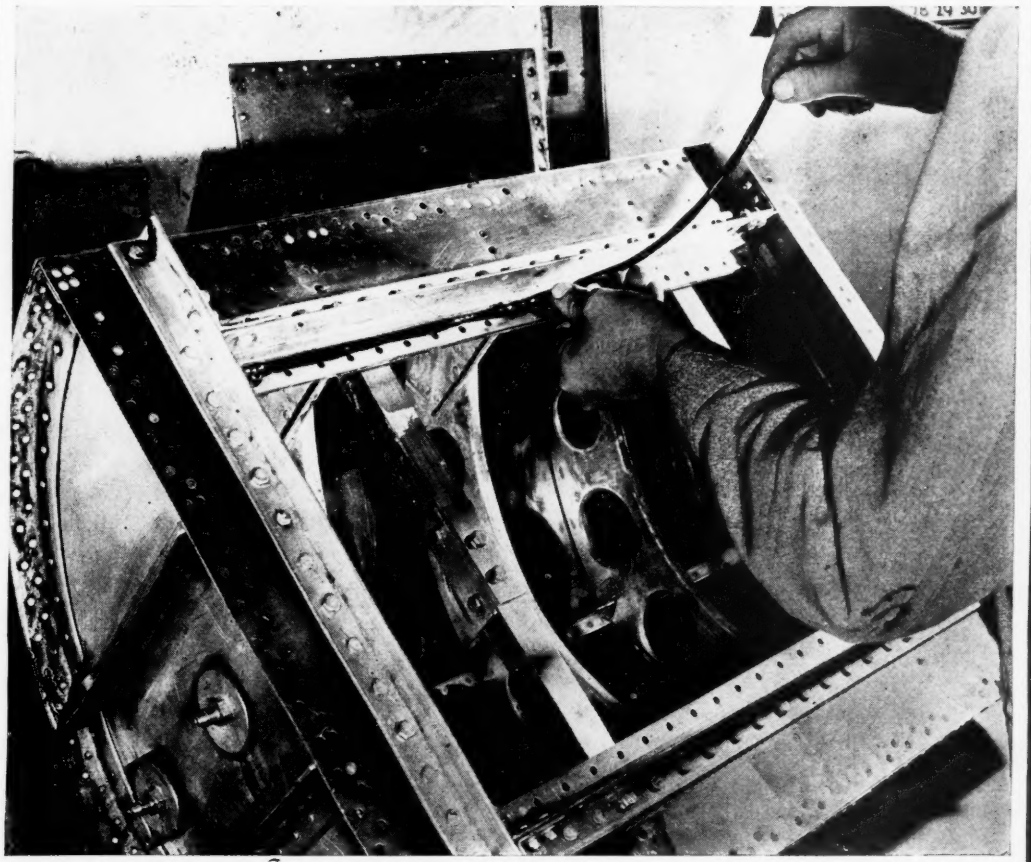

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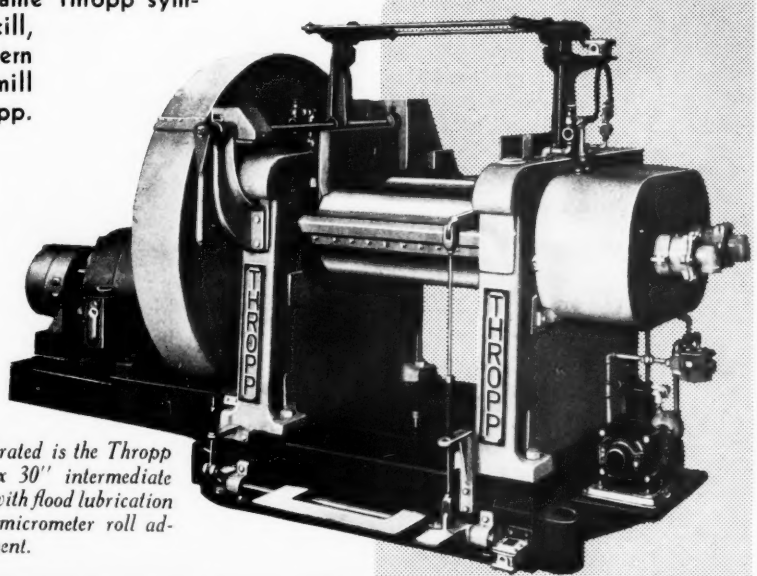

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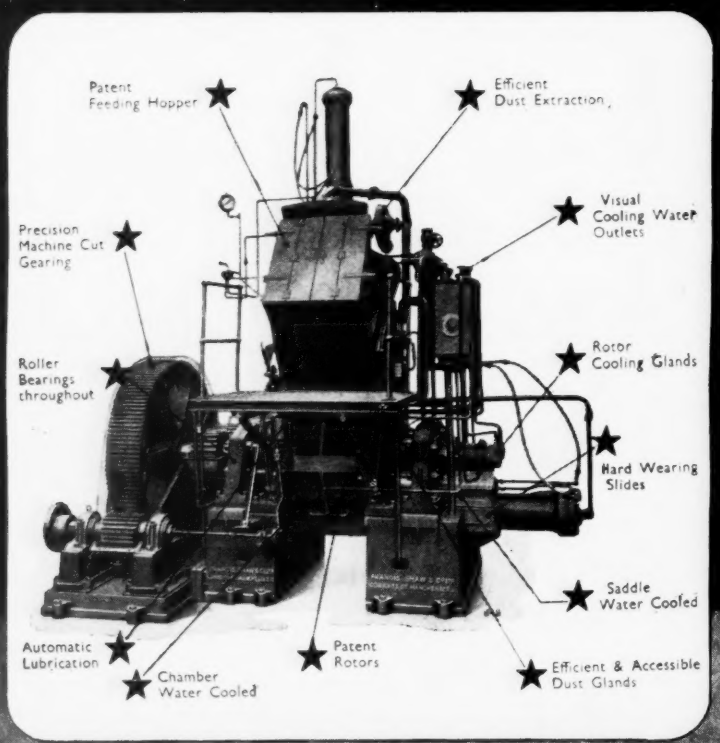

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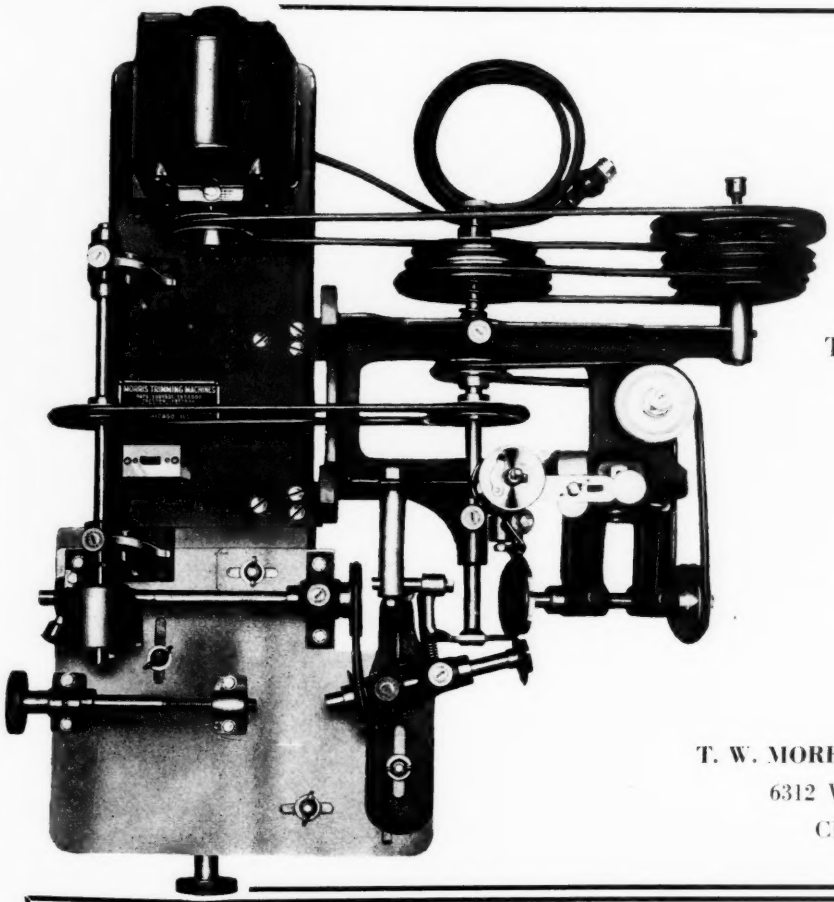

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VOLUME 108 NUMBER 6

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Volume 108 **New York, September, 1943** **Number 6**

The Effect of Petroleum Solvents

On the Cold Resistance of Synthetic Vulcanizates[1]

Ross E. Morris,
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Emil H. Berger,
Assistant Rubber Technologist, Rubber Laboratory, Navy Yard, Mare Island, Calif.

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Senior Material Engineer, Standards and Tests Section, Bureau of Ships, Navy Department, Washington, D. C.

VULCANIZATES prepared from the oil-resistant synthetic rubbers are frequently called upon to withstand low temperatures in service. This is particularly true of applications in airplanes although fairly low temperatures are also encountered in ground service or on shipboard. Oil and gasoline hose, for example, must remain flexible at low temperatures for ease in handling. Unfortunately all the oil-resistant rubbers are affected adversely by low temperatures, much more so than *Hevea* rubber, and they require special compounding to improve their cold resistance.[2] The general practice has been to include certain ester-type softeners in the formulations for this purpose.

Gasolines and other light petroleum products are absorbed to some extent in all oil-resistant vulcanizates if the solvent is left in contact with the rubber for a length of time. Meanwhile the solvent gradually extracts the softeners from the rubber. The question is: Does the absorbed solvent have a beneficial effect on cold resistance, particularly in view of the fact that protective softeners may be extracted?

The lighter petroleum products have very low freezing points; for example, the freezing point of ordinary gasoline is below —100° F. Therefore their presence in the rubbers should be beneficial from the standpoint of cold resistance.

Vulcanizates Tested

To find the effect of absorbed solvent on the cold resistance of synthetic rubber vulcanizates, typical gasoline hose stocks were prepared from Neoprene GN, Neoprene ILS, "Thiokol" FA, Hycar OR-15, and Perbunan. The brittle points of these stocks were then determined before and after immersion at 82° F. in iso-octane, 100-octane gasoline, and a blend of 100-octane gasoline with aromatics. The volume change and extraction by these solvents were also found.

Previous work indicated that 30 days were a sufficiently long time for these stocks to reach equilibrium with respect to volume change and extraction in these solvents. This being the case, it was reasonable to assume that the brittleness values for these stocks would also reach constancy in this time.

The recipes, optimum sheet cures, tensile properties, and Shore hardnesses of the stocks are given in Table 1. None of these stocks was compounded especially for cold resistance. These stocks complied with the limitations on rubber content imposed by the War Production Board Supplementary Order M-15-b 1, Amendment 9. They

TABLE 1. RECIPES, CURES, AND SOME PHYSICAL PROPERTIES OF THE SYNTHETIC VULCANIZATES

Recipe	Neoprene GN	Neoprene ILS	"Thiokol" FA	Hycar OR-15	Perbunan
Neoprene GN	100.0				
Neoprene ILS		100.0			
"Thiokol" FA			100.0		
Hycar OR-15				100.0	
Perbunan					100.0
Semi-reenforcing black			75.0	80.0	80.0
Soft thermal black	125.0	100.0		40.0	40.0
Zinc oxide	5.0	10.0	10.0	5.0	5.0
Light calcined magnesia	4.0	10.0			
Stearic acid	0.5	0.5	0.5	1.0	1.0
Dibutyl phthalate				15.0	
Bardol					15.0
Circo light process oil	10.0				
Cumar P-25			5.0		
Advagum		30.0		25.0	25.0
Phenyl alpha naphthylamine	2.0	2.0		1.0	1.0
D.O.T.G. salt of dicatechal borate		1.0			
Benzothiazyl disulphide			0.3	1.75	1.75
Diphenylguanidine			0.1		
Micronized sulphur				1.75	1.75
Sheet Cure					
Time, Min.	40	40	40	60	60
Temperature ° F.	287	307	298	274	274
Physical Properties					
Tensile strength, p.s.i.	1740	1530	1160	1720	1640
Ultimate elongation, %	310	350	250	380	420
Shore hardness, ¼-inch thickness	69	67	73	65	64

[1] The opinions or assertations contained herein are the private ones of the authors and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

[2] Morris, James, and Werkenthin, *Ind. Eng. Chem.*, Aug., 1943.

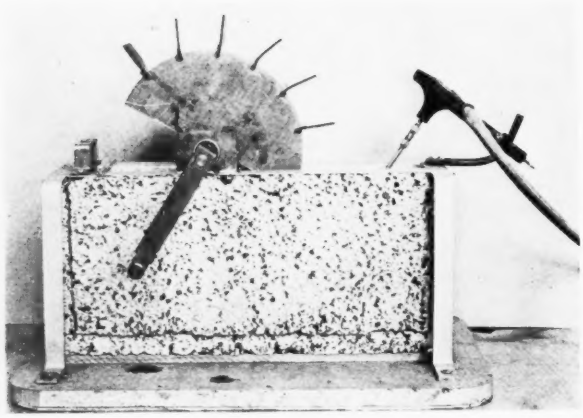


Fig. 1. The Brittle Point Apparatus

also complied with the Bureau of Ships ad interim specification for smooth bore gasoline hose.[3] All of these stocks handled satisfactorily on the calender.

Solvent Characteristics

A 100-octane gasoline (containing lead tetraethyl) and a blend of this gasoline with aromatics were employed as solvents in this test because these fuels are probably the most severe of any petroleum solvents in their action on hose tubes. The blend was made up of the following proportions by volume:

60% 100-octane gasoline
20% Toluol
15% Xylol
5% Benzol

All of the aromatic constituents in this blend were the chemically pure grade. The aniline points and diesel indices of the 100-octane gasoline and the blend are given in Table 2. These properties have been connected with the swelling power of solvents by Fraser.[4]

TABLE 2. PROPERTIES OF SOLVENTS

Solvent	Aniline Point ° F.	Diesel Index
Iso-octane	173.8	123.7
Gasoline	147.7	97.3
Gasoline-aromatic blend	61.7	31.1

[3] Bureau of Ships Spec. 33H17(INT) of Jan. 2, 1943.
[4] Fraser, *Ind. Eng. Chem.*, 32, 320 (1940); 34, 1298 (1942); *Rubber Chem. Tech.*, 14, 204 (1941).
[5] Pure iso-octane boils at 210.6° F.
[6] Selker, Winspear, and Kemp, *Ind. Eng. Chem.*, 34, 357 (1942).

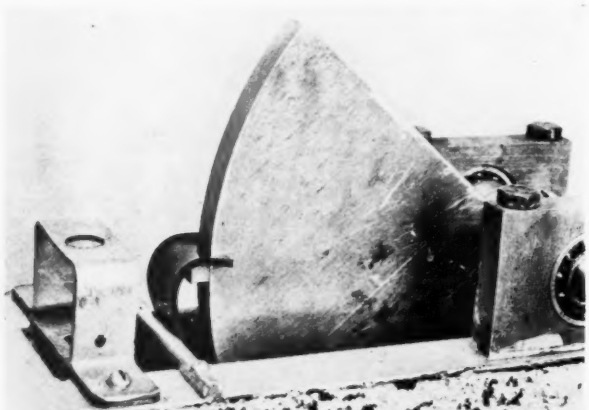


Fig. 2. Closeup of Specimen Striking the Rod in the Brittle Point Apparatus

Iso-octane was included in the study for an academic reason. It was desired to find what effect on brittle points would be obtained by a relatively pure aliphatic liquid of the type found in gasolines. This solvent was prepared by fractionating a technical grade of iso-octane and collecting the fraction boiling in the range 210-215° F.[5] The aniline point and diesel index of this solvent are listed in Table 2. The high aniline point of iso-octane is characteristic of an aliphatic compound.

Apparatus for Brittleness Test

The brittleness test developed by Selker, Winspear, and Kemp[6] with slight modification was employed as a measure of cold resistance. This test locates the temperature at which a rubber specimen cracks when bent rapidly around a small radius. This temperature, termed the brittle point, is a characteristic property of every rubber,

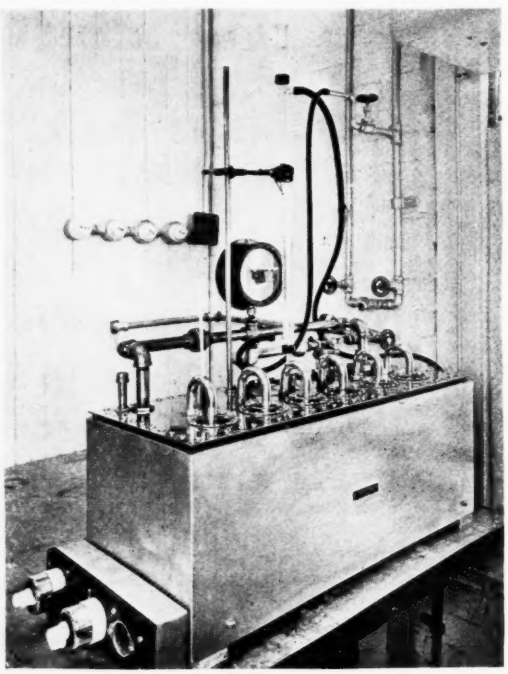


Fig. 3. Apparatus for A. S. T. M. Evaporation of Gasoline for Determination of Gum Content

assuming that the rate and the radius of bending are held constant.

The apparatus consisted of an insulated steel tank, 18 by 2 by 8 inches. Seven inches from one end on the top was mounted a brass semi-circle of 4.87-inch radius and 0.50-inch thickness, keyed to a shaft. Six notches, 0.25-inch deep and 0.075-inch wide, were spaced at two-inch intervals on the rim of the semi-circle. Each notch was backed with a block extending 0.25-inch above the rim. A stiff ¼-inch round rod was fixed across the tank exactly 0.5-inch from the rim of the semi-circle. The shaft upon which the sample-holding fixture was mounted had a crank which on rotation immersed the specimens in the tank. The shaft was supported on ball bearings.

A suitable liquid, cooled by adding lumps of dry ice, was used as the immersion medium. The liquid was circulated by an air-driven stirring motor. The temperature of the liquid, determined with a thermocouple, was raised rapidly when desired by adding warm liquid or inserting a 500-watt immersion heater in the bath.

Photographs of the apparatus are shown in Figures 1

and 2. Figure 1 shows the insulated tank, the brass semi-circle with six specimens in position for breaking, the crank, and the air-operated stirring motor. Figure 2 shows a closeup of the specimen striking the round rod. In Figure 2 may also be seen the support for a thermometer, although, as mentioned above, the authors preferred to use a thermocouple for measuring the temperature of the solvent.

A close-fitting sheet metal hood was placed over most of the tank after insertion of the specimen in order to prevent splashing the alcohol out of the tank when the crank was turned rapidly. This hood is not shown in the photographs.

Treatment of Specimens

Specimens, one inch by two inches, were died from test sheets 0.08-inch thick, which had been lightly buffed on both sides. The original brittle point of each stock was found using some of these specimens. Then the volumes of 15 of these specimens from each stock were determined with a Jolly balance, and the specimens were immersed individually in 100 milliliters of each solvent in separate containers. Thus 225 containers were required for this test. The containers were tightly closed and let stand for 30 days at 82° F. plus or minus 5° F.

At the end of the 30-day period the volumes of the specimens were measured again to find the volume change, and then the brittle points were determined immediately in a cold bath of the same solvent in which the respective specimens had been immersed. During the several minutes between these operations the specimens were immersed again in the respective solvents so that no evaporation loss would occur from the specimens themselves. The extracted materials in the solvents were found by a procedure which will be described later.

Determination of Brittle Points

The brittle points were ascertained by the following procedure. One end of the specimens was inserted into a notch on the rim of the semi-circle by grasping the corners with pliers and stretching the rubber so as to decrease its thickness and allow it to slip freely into the notch. When the tension was relaxed, the rubber formed a snug fit in the notch and overlapped ¼-inch on each side of the semi-circle. It was found advisable to insert and test only one specimen at a time on the rim of the semi-circle in order to obtain maximum velocity of impact.

The tank was filled to within three inches of the top with liquid, cooled to the desired temperature by chunks of dry ice. The cooled liquid was circulated by means of the stirring device. When the liquid had arrived at the desired temperature, the semi-circle was turned so that the specimen was immersed in the cold liquid. Exactly two minutes after the specimen was immersed the crank was turned rapidly in a clockwise direction so that the specimen struck the horizontal bar just as it rose out of the liquid. The temperature at which the specimen was cracked by this treatment was considered to be the brittle point of the rubber. It was found that the brittle points of different specimens of the same stock generally agreed within 1.0° F.

Determination of Extractable Materials

The extracted material in the solvents was found by evaporating the respective solvents to dryness in tared 100-milliliter beakers according to the A.S.T.M. standard method of test for gum content of gasoline.[7] In this method the gasoline contained in a beaker is evaporated by placing the beaker into a well over a bath maintained at 320 to 330° F. During the evaporation a blast of air at the same temperature as the bath blows over the gasoline. After the gasoline has evaporated, the beaker is heated for an additional 15 minutes; then it is cooled and weighed. The apparatus used for this evaporation is shown in Figure 3. The advantage of employing this evaporation procedure over the procedure generally described in specifications will be the subject of another paper.

[7] A.S.T.M. Standard Method of Test for Gum Content of Gasoline, Designation: D381-36.

Initial Brittle Points

TABLE 3. EFFECT OF SOLVENT ON ORIGINAL BRITTLE POINT

Vulcanizate	Brittle Point, ° F.—in			
	Methyl Alcohol	Iso-Octane	Gasoline	Gasoline-Aromatic Blend
Neoprene GN	—32	—35	—35	—39
Neoprene ILS	—18	—20	—17	—15
"Thiokol" FA	—27	—24	—24	—26
Hycar OR-15	0	8	4	3
Perbunan	—17	—21	—19	—18

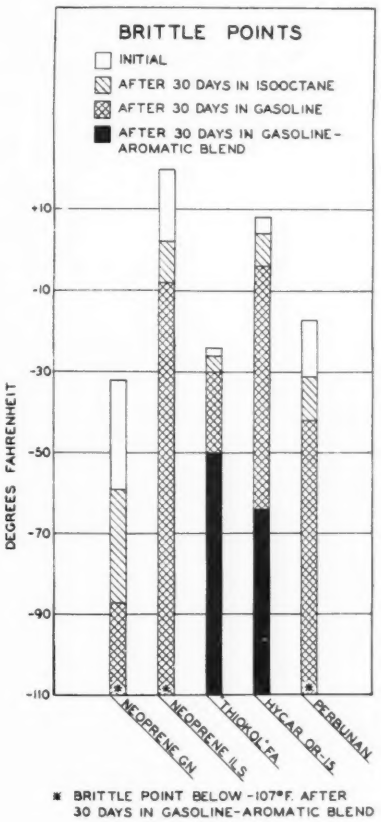


Fig. 4. Brittle Points before and after Immersion in the Various Solvents

There was some question as to the correct liquid to use in the cooling bath when determining the initial brittle points. Methyl alcohol and the three petroleum solvents were tried. The results are given in Table 3. It will be noted that the brittle points found depended upon the liquid used. For example, the Hycar OR-15 stock had an 8° F. higher brittle point in iso-octane than in methyl alcohol. This behavior indicated that more permeation of the cooling liquid into the rubber occurred during the two-minute cooling period in the case of the specimens of each stock which showed the lower brittle points. In support of this statement it was found by measurement that the Hycar OR-15 stock was swollen 4.6% by methyl alcohol

(*Continued on page 558*)

Rubber after the War—III

K. E. Knorr[1]

SYNTHETIC RUBBER FOR MILITARY SECURITY. The military self-sufficiency argument is generally conceded and fully deserves first place in protectionist considerations. Complete dependence upon a rubber supply accessible only over thousands of miles of vulnerable shipping lanes indeed spells danger in a world of intermittent international strife. This is true of rubber as of many other essential raw materials. If the present war ends in decisive victory on the part of the Allies, the United States and Great Britain will be the two greatest naval powers of the world and will be able to maintain this supremacy at least for a decade. It can be argued that, in the long run, it would be cheaper for a powerful nation like the United States to exert its influence vigilantly toward the prevention of recurring wars than to bear the economic burdens of all-round self-containment. Yet this country will not be omnipotent after the war; vigilance may be relaxed; faulty policies may be adopted; and after the experience with the League of Nations even the establishment of an apparently adequate peace-enforcement agency will presumably fail to yield a feeling of complete security.

The postwar evolution of the international scene undoubtedly will impinge upon the solution of the rubber problem. In the unlikely event that Japan should not be defeated decisively or that the United Nations should become acutely disunited, the subsidization of a substantial synthetic rubber industry at considerable cost would be an exceedingly reasonable undertaking for the United States. Let us assume, however, that Japan's vicious stranglehold over southeastern Asia will be broken effectively, and that there is a good prospect of a prolonged period of peace. How will the rubber problem look in such a setting?

The notion that this country must obtain all its rubber either from Malaysia or from a domestic synthetic industry can easily be dispelled. Even the Germans, when still sure of victory, did not contemplate complete reliance upon a European synthetic rubber industry after the war. Following several years of experience with Buna S tires, the Germans expressed preference for a tire that contains more natural rubber than was available for their war tires. Similarly, it is inconceivable that the United States will reject the use of plantation rubber entirely, if only because for many applications the natural product is eminently suitable as well as cheaper than artificial rubbers.

On the other hand the United States will never again be so dependent on Asiatic rubber as before. Prior to the war synthetic rubber production in this country, though growing, was negligible. It amounted to only 1,700 tons in 1939. When peace comes, the industry will not only have a huge plant capacity, but will also have accumulated a body of technical experience that in normal times would have accrued only over a much longer period of time. Synthetic rubbers can be varied amazingly. In a sense they are made-to-order materials, and their specific properties will make them preferable to natural rubber for a great many purposes capable of expansion to large volume. Some artificial rubbers will certainly grow beyond the stage of special-purpose materials. They will invade the field in which natural rubber was used in bulk. Buna S treads for tires are an example. If the properties of artificial rubbers are improved, and manufacturing costs reduced, as many technologists confidently predict, it is very likely that, despite a price differential of around 9¢ or 10¢ a pound, perhaps one-fourth or one-third of the United States rubber requirements other than reclaim will be supplied by the synthetic industry even without protection.

The exact share of synthetic materials in the United States rubber consumption will depend on, and change with, the price and quality differential between the rival rubbers involved. In the long run change is likely to mean expanding use of artificial rubbers, although increased longevity of synthetic rubber products will tend to some extent to decrease the demand-volume for the new material. If, following the transition period, the share of synthetics should amount to less than one-quarter or one-third of our total average volume of absorption, government intervention might be instituted to correct the result of *laissez-faire* conditions.

Effective encouragement could be granted in several ways. An infant-industry tariff, providing for an import duty of from 1¢ to 3¢ a pound, would probably accomplish the desired balance. Yet such an arrangement would not only raise the price of all rubber to American consumers; it is also open to the serious objection that temporary duties of this kind have an apparently insuperable tendency to be increased and to assume permanency. The result would be expensive rubber and expensive rubber articles in the long run. The alternative establishment of a system of import quotas, while more effective restrictively, is even more obnoxious on the grounds just mentioned and in view of a highly variable demand would be very difficult to administer.

A temporary advantage might be extended to the new industry by the condition under which government-owned plants are released to private ownership. Ordinarily the purchase price is computed on the basis of construction costs minus depreciation. Yet the government might charge a lower price than would be arrived at by this method. To some extent that would be justified under any circumstances, since construction costs in many cases included exceptional expenditure because of faulty preparation of plans or because of overtime payments to workers and bonus payments to contractors aimed at speeding up construction. Apart from such allowances, the government might negotiate a purchase price that would contain a clear subsidy of varying proportion, release without payment being the only limit to the size of the subsidy. The objection to this procedure is that it would be extremely difficult to adopt a plan of selective subsidization, that is, to grant it to the more efficient plants and deny it to the others.[2] This policy would, furthermore, discourage the building by private industry of entirely new plants based on an advanced fund of technical knowledge.

If necessary, recourse to a more direct and flexible form of subsidization seems the wisest procedure. One or more of the most efficient government plants that have not been acquired by private industry could be operated

[1] Food Research Institute, Stanford University, Calif.

[2] It is possible, of course, that some plants are so uneconomic from the viewpoint of peacetime production that they will find no private buyers at all.

by a private concern on the present wartime basis of government ownership and cost-plus-fee remuneration. The rubber thus produced could be sold at the current market price. This method would possess great variability since the subsidized volume of production could be increased, especially if some plants are maintained in stand-by operation condition, or decreased if developments call for such modifications. The subsidy involved would be direct and could be ascertained precisely. Its burden would be distributed much more fairly through taxation than by an over-all increase in rubber prices. Above all, this procedure would insure to the consumer the maximum price advantage of competition obtainable under the circumstances.

A domestic synthetic rubber industry producing about one-third of the country's normal requirements could not be regarded as furnishing assurance of sufficient supplies in a world from which recurrent wars cannot be banned. The needed margin of security could be easily obtained by a permanent government stock-holding program comprising about one year's normal requirements. The physical storability of rubber in conjunction with provision for the regular movement of stocks makes such an arrangement perfectly practicable.

In case of an emergency, then, the United States would have a year's normal requirements of rubber in addition to stocks carried by the rubber goods manufacturing industry, rubber shipments from accessible Latin American countries, and a fairly large synthetic rubber industry, which could be rapidly expanded.[3] Such a program seems capable of satisfying any reasonable desire for security. The proposal, furthermore, is based on rather pessimistic premises. If, as many expert observers expect, the secular trend of development should favor the synthetic materials more than is assumed in the above discussion, the American rubber position will be even stronger from the viewpoint of military preparedness than we have stated. The economic advantages of the indicated policy will be discussed below.

Synthetic Plants Only a War Industry? Whether it is foolish or wise to "junk" a large war industry built at public expense, once the security problem is solved, is obviously an economic question. If it should be less costly to the public to junk than to "protect" or to subsidize, then junking is undoubtedly wise. Nobody will advocate full postwar utilization of war-inflated shipyards and airplane factories just because they were expanded at the expense of the taxpayer. The proposition to continue operation of the synthetic rubber industry admittedly appears to make more sense since its product would replace an imported material. Even if such a policy were to be found sound, however, some contraction would be unavoidable because a capacity of around, or more than, one million tons would be excessive in relation to the country's normal postwar demand for rubber.

Suppose, for the sake of argument, that normal postwar absorption of rubber in the United States would average about 750,000 tons. Suppose that natural rubber sells for 10*c* and general-purpose synthetic rubber for 20*c* a pound. Suppose that 250,000 tons of domestic artificial rubber are marketed without subsidization. If the government were to impose prohibitive tariff duties on rubber imports so that only American-made rubber were consumed, then the American consumer of rubber articles would foot the bill to the extent of roughly 112 million dollars a year, or over half a billion dollars in five years.[4]

Now, what are the presumable costs of scrapping two-thirds of the industry? The cost of the government construction program has been estimated at somewhat under 100 million dollars per 100,000 tons of capacity. Since actual capacity in many cases will exceed rated capacity, the expenditure may be smaller than stated. The abandonment of 500,000 tons of capacity appears then to involve 425 million dollars. However synthetic manufacturers cautiously put plant amortization on a five-year basis. Suppose that the bulk of the planned capacity will be operated for two full years until Japan is defeated in southeastern Asia, and that for another period of at least two years the demand for rubber will be abnormally large, and the Malaysian rubber industry will be in the process of reconstruction and therefore unable to supply a large share of the world's rubber requirements. This would mean that the plant value to be written off under the circumstances assumed would be no larger than the cost of protection for one year. In other words, over a five-year period of normal demand, a policy of nonprotection would save several hundred million dollars to the consumer of rubber goods in this country.[5]

Such a decision would have still other advantages. The rate of obsolescence is notoriously heavy in the case of new industries. This is all the more true when an immense plant capacity has to be constructed within the shortest possible time. A considerable portion of the plants abandoned might be markedly obsolete on the basis of the technological knowledge that will have accumulated during the next four or five years. If they were abandoned, future reexpansion of the industry in peacetime would, therefore, proceed in a more economical fashion, while subsidization would encourage manufacturers to go on using partially or wholly obsolete plants. Moreover, intense market competition between plantation and artificial rubbers would in itself serve as a constant and powerful incentive towards rapid technical progress.

U. S. Synthetic Rubber Will Prevent Monopolistic Control. Prior to the war the supply of plantation rubber was subject to monopolistic control, which did indeed raise the price of rubber over what it would have been in the absence of organized restriction. It is extremely unlikely that a tight regulation scheme could be reestablished after the war without the sanction of the United States. Possessing a huge synthetic industry and weighing the problem of protection or non-protection, this country will enjoy a formidable bargaining position. Free entry of rubber could be made conditional on the absence of a producers' control over the supply of plantation rubber, or, if continuation of such control were approved, the United States could secure a strong voice in the shaping of regulative policies. Moreover retention of a potent synthetic industry, capable of supplying about one-third of the country's requirements, in addition to a rubber reclamation industry and large reserve stocks, would insure the United States permanently against exploitative price policies on the part of a comprehensive Malaysian control organization.

A. C. Matthew, chairman of the British Rubber Grow-

[3] In 1939 the synthetic rubber output of the United States was negligible and the task of expanding it to the spectacular magnitude now envisaged was, therefore, truly gigantic. Obviously, doubling or trebling the capacity of a large existing industry can be expected to be a comparatively much easier and speedier process. It can also be assumed that in a future emergency public action would be taken at an earlier moment and with greater vigor than in 1939.

[4] In reality, of course, the effective price differential and, hence, the subsidy involved might be either smaller or larger. In the long run technological developments also can be assumed to cause a cost-decreasing trend. On the other hand, this cost-decreasing tendency would probably be slowed up under conditions of high-tariff protection and possible monopolization of the industry.

[5] Actually the amortization rate mentioned above may prove far too conservative. But it must also be assumed that abandonment of the plants involved will not be equivalent to a total loss. Apart from the fact that some plants may be maintained in stand-by operating condition for a later emergency, land, buildings, and part of the equipment can probably be diverted to other uses.

Cia. Ford Industrial do Brasil

Matured Trees at Fordlandia (Brazil) Being Tapped

ers Association, recently suggested "that there will be room for both [natural and synthetic rubber] in co-partnership with our friends in the USA by postwar agreement on much the same lines as the International Rubber Regulation Scheme." Other representatives of the British rubber industry also have expressed the hope that the United States might be persuaded to include its synthetic rubber industry in a worldwide restriction agreement that would fix output and export quotas for all producing countries. Short of being assured sole access to the United States market by tariff barriers, this proposal might be received favorably by some vested interests in this country. As one method of dealing with a pressing problem of surplus-production capacity, such an arrangement could be defended on the very same grounds that prompted the establishment of the International Wheat Agreement.

The idea, however, is objectionable for the same reasons that were advanced against the proponents of effective tariff or quota protection. Indeed the drawbacks of protection against imports would be joined to the drawbacks of a tight scheme of output and export restriction. As mentioned above, mechanical output restriction instead of the curtailment of excessive surplus-production capacity by the elimination of less efficient producers increases average costs and, by freezing a historical pattern of production as between countries and enterprises, operates to slow down technological progress. Rubber consumers all over the world, including the United States, would suffer continuous damage in the form of unnecessarily high rubber prices.

Besides an intelligent handling of the world rubber situation after the war can prevent the entrenchment of a sizable surplus of production capacity. If the British and Dutch refrain from helping high-cost producing units, to the extent of perhaps 250,000 or 300,000 tons, to their feet, if the United States synthetic rubber industry does not substantially exceed a capacity of 250,000 tons as assumed above, if no over-ambitious rubber production program is artificially fostered in Latin America, and if other countries with synthetic rubber industries (perhaps outside Soviet Russia) can be induced to follow the example of the United States—then the future world capacity to produce rubber will scarcely be much out of line with the future world capacity to consume. On several occasions in the past the demand for rubber has expanded with abrupt rapidity. An over-all surplus-production capacity of, say about 20% of average world absorption, is therefore required as a reasonable margin of supply security.

(To be concluded)

Effect of Petroleum Solvents

(Continued from page 555)

in two minutes at room temperature, but only 0.7% by iso-octane.

It was decided to consider the highest brittle point found for each stock as the correct value. Thus the values found in methyl alcohol were regarded as correct for the Neoprene GN and Perbunan stocks, and the values found in iso-octane were regarded as correct for the Neoprene ILS, "Thiokol" FA, and Hycar OR-15 stocks.

Results of Tests

The brittle points before and after immersion in the various solvents are graphed in Figure 4. The volume change and extraction data are given in Table 4. The bar graph and the volume change data indicate quite clearly that immersion in petroleum solvents lowers the brittle point and that the greater the swelling, the greater the brittle point lowering. This relation was particularly evident in the cases of the Neoprene GN, Neoprene ILS, and Perbunan specimens after immersion in the gasoline-aromatic blend. These specimens were considerably swollen and had lower brittle points than could be reached by dry ice in that solvent.

TABLE 4. VOLUME CHANGE AND EXTRACTION DATA

	Iso-Octane		Gasoline		Gasoline-Aromatic Blend	
Vulcanizate	Volume Change %	Extraction %	Volume Change %	Extraction %	Volume Change %	Extraction %
Neoprene GN	6.7	1.5	15.4	2.3	75.7	2.9
Neoprene ILS	−0.4	0.4	2.7	1.0	23.2	3.4
"Thiokol" FA	−1.2	0.6	0.1	0.9	7.8	2.4
Hycar OR-15	−2.4	0.6	−1.3	0.7	7.1	4.0
Perbunan	−2.5	1.6	0.1	2.6	80.4	4.4

The aniline point or diesel index of the solvents can be correlated with the behavior of the vulcanizates in the solvents. The lower the aniline point or diesel index of the solvent is (i.e., the greater the aromatic content), the greater the volume changes in a positive direction of the vulcanizates and the lower their brittle points. Iso-octane, a 100% aliphatic compound, possesses a high aniline point and a high diesel index; accordingly, it had the least effect on the brittle points of the vulcanizates.

The volume changes of all except the Neoprene GN stock were negative in iso-octane. This behavior was due to the extraction of softeners, although the weight of softeners removed according to the A.S.T.M. evaporation method was generally less than was indicated by the shrinkage in volume, assuming a reasonable specific gravity for these materials. Apparently some of the softeners were lost by evaporation or sublimation during the evaporation of the solvent. At any rate the amount of material extracted from the rubbers increased in every case as the aniline point of the solvent decreased.

Conclusion

It is concluded that immersion in light petroleum solvents improves the cold resistance of synthetic vulcanizates, and that the greater is the aromatic content (i.e., the lower the aniline point) of the solvent, the greater will be this improvement.

SILVERTOWN TIRES ON THE AIRPLANE *Spirit of St. Louis* in Smithsonian Institute are 15 years old and are still in good condition. *The Rubber News Letter* (The B. F. Goodrich Co.).

Recent Russian Literature on Natural and Synthetic Rubber—III

M. Hoseh

THE Physical Chemistry of Surface Phenomena in Rubber Technology. VII.[1] The Theory of Vulcanization of Rubber. V. B. Margaritov, *Kauchuk i Rezina*, 45-52 (1937). **SN-2.**

Vulcanization is regarded as a process of filling rubber to saturation with a "rubberophilic" substance, i.e., having an affinity for rubber, in this case sulphur. Thus the kinetics of vulcanization become the kinetics of S dispersion since vulcanization is possible only when S attains a certain degree of dispersion. Accelerating vulcanization implies peptization of S; while flocculation of S results in the opposite effect. It is evident that substances which peptize S are by the same token accelerators. When dispersed sulphur comes together with rubber, rubber micelles become oriented on the surface of a S particle and form an envelop around it. S also fixes rubber micelles chemically by one of its double bonds. An S particle surrounded by an envelop of rubber micelles becomes "fixed" because the surrounding micelles will prevent its dissolution. In the chemical fixing of rubber by S, only one of the double bonds is utilized; therefore vulcanized rubber can still be brominated. The direct chemical fixation of the solvated layer results in increased strength of vulcanized rubber as compared to rubber merely loaded with a filler. In the temperature range of 119-162° C., S exists in an equilibrium $S\lambda \rightleftharpoons S\mu$ of which $S\lambda$ is liquid and soluble; whereas $S\mu$ is liquid and insoluble. Both modifications of S perform a distinct function in vulcanization. $S\lambda$ acts as an activated filler, effectively stabilized by amines; while the $S\mu$ acts as centers for solvated rubber micelles. Thus vulcanized rubber is a complex polyphase system in which amorphous, polar $S\mu$ forms nuclei around which rubber micelles form solvated envelopes, and the predominant $S\lambda$, stabilized by accelerators, performs the function of an activated filler not unlike ZnO; these two are dispersed in the bulk of the rubber. The diffuse rubber envelopes attached to the nonpolar part of the oriented amines bind the "localized vulcanization centers." Accelerators affect only the "free" S, stabilizing it in the rubber. Thus by the nature of their action they are activators for fillers. Adding to the rubber another filler, e.g., carbon black, retards vulcanization. This is because of the "competition" between the S and the added filler for the solvation envelop. It is noteworthy that ZnO activates vulcanization only when used in a quantity required to form a Zn soap. This latter apparently affects only the rubber, since soaps, e.g., Mg and Zn stearate, do not stabilize S. Optimum vulcanization, and thereby maximum strength, is attained when the two S modifications in the rubber are in equilibrium. Overvulcanization, caused either by too high temperature or too long treatment, is connected with an excess of $S\mu$ and a corresponding deficiency of $S\lambda$. Undervulcanization is connected with the opposite relation of the two S modifications.

Effect of Thermal Treatment in the Presence of Surface Active Substances on the Mechanical Properties of SK[2] Sols. V. B. Margaritov, *Kauchuk i Rezina*, 9-15 (1937). **S-16.**

Varying amounts of several surface-active nitrogen containing compounds were added to 2% SK sols in toluene. The test tubes containing the sol-surface-active compound mixtures were sealed and kept in a thermostat at 100, 130, and 160°C. for periods of 15 minutes to three hours. The compounds used were: azobenzene, aniline, Fatty Orange D, Sudan IV, benzidine, and Tipophor Brown F.R. The changes induced by heating were determined by measuring the structural viscosity in an Ubbelohde viscosimeter. The results are expressed in terms of apparent fluidity and in terms of the critical force of displacement. The concentration of the surface-active compounds was calculated in per cent. of the SK in the test tubes. In per cent. of the solution as a whole, the concentrations of the added compounds did not exceed 0.0004%. Unless these compounds affected the viscosity of the SK, they could not affect the viscosity of the solution when present in such negligible concentrations.

Thermal treatment in the presence of Fatty Orange D and Sudan IV (aminoazotoluene + β = naphthol) causes more or less of destruction of the colloidal structure of SK. This is manifested by a sharp drop in the value of the critical force of displacement. The curves for azobenzene, aniline, and benzidine have quite a distinct maximum. This indicates that for these substances there are definite conditions for the duration of the heat treatment which give optimal results. In the case of benzidine the period at which best results are obtained depends on the concentration; when the latter increases, the period shortens. For aniline the optimum concentration (0.1% of the SK, 0.002% of the solution) is the same for all temperatures. Tipophor Brown F.R. raises the critical force of displacement of a sol containing this compound at room temperature. The degree of this increase is in direct ratio to the duration of contact of the compound and the sol. The critical force of displacement *vs.* time of heating curve of a sol containing this compound goes through a minimum. This indicates that a thermal treatment destroys the colloidal structure of this sol-surface-active compound mixture. It also shows that strongly effective, surface-active substances make thermal treatment unnecessary and in some instances destructive. The results show that the viscosity (measured in terms of apparent fluidity) of SK sols heated in the presence of surface-active substances decreases. The decrease in viscosity upon heating was attributed by some investigators to the breaking up of the chains of rubber molecules as a consequence of oxidation depolymerization. The breaking points are the double bonds. However the fact that a definite structure is developed when an SK-surface-active compound mixture is heated, as evidenced by definite values of the critical point of displacement, and the fact that in SK the double bonds are in the side chains, make oxidative depolymerization theory hardly tenable. These phenomena are more correctly explained by the lyophilic nature of the SK colloids. SK is a polydisperse system within which high and low aggregates are in

[1] This is the seventh paper of this series published by several prominent Russian researchers. The first six were published prior to 1937 and are not included in this review. For the preceding papers cf., *Zhurnal Rezinovoi Promyshlennosti* Nos. 11 and 12 (1935) and Nos. 3, 5, 6, and 10 (1936).

[2] Straight butadiene synthetic rubber.

equilibrium. Heating the system in the presence of surface-active substances displaces the equilibrium toward lower aggregates.

Fibrous Structure and Resistance to Tear of SK Mixtures. A. Kusov. *Kauchuk i Rezina*, 6, 37-48 (1937). **SN-3.**

The resistance to tear offered by rubber is attributed to its fibrous structure. The effect of a number of factors on the resistance to tear and on the structure of SK was investigated. The investigation included the effect of: (1) mechanical working on the fibrous structure of rubber; (2) the vulcanization period; (3) plasticity of the specimen; (4) the thickness; (5) the depth of incision; and (6) ingredients: carbon black and ZnO. The tested specimens had the shape of a disk with one segment extended. Both SK and NK (natural rubber) were tested, the latter primarily for the purpose of comparison. The resistance to tear was determined in a modified dynamometer such as is commonly used for testing thread. A detailed composition of the compounds used for the preparation of the specimens is given. The results show that in its resistance to tear SK is equal or superior to NK. The addition of gas black in quantities of 10-100% of the weight of rubber to SK greatly improves the tear strength. The optimum results are produced with an addition of 50-75%. ZnO added in amounts of 8-14% increases the tear resistance of both natural and synthetic rubber. Products having an increased content of components with a fibrous structure are stronger if the fibers are arranged in the direction of force. A low plasticity (0.31) greatly lowers the resistance to tear of SK as does a high plasticity (0.87). Best results are given by specimens having a medium plasticity (0.53 and 0.40). In making these determinations the thickness of the specimens should not vary greatly from a predetermined value. No more than 10-15% variation in thickness is tolerable. The depth of incision lowers the tear strength of synthetic rubber less than of natural rubber: namely, two to three times in synthetic as compared to 3.5-6.5 times in natural rubber. Synthetic rubber containing gas black may show under the influence of strains and stresses structural forms similar to those of natural rubber, viz., zigzag, knotty, or concentric. Specimens of synthetic rubber having a low tear resistance show a simple and smooth surface at the breaking place; whereas specimens with a high tear resistance have a complicated and jagged surface.

Polymerization of Divinyl in an Alternating Field. N. Apar'eva, P. Zolotarev, and E. Shilov. *Kauchuk i Rezina*, 7/8, 37-8 (1937). **S-17.**

A report on preliminary experiments on polymerizing divinyl in an alternating electric field is given. Redistilled and dried over Na, divinyl was subjected to an alternating field of approximately 600,000 cycles per second frequency at room temperature and at 50° C. After 12 days at 50° C. 1% of the polymer was found. It was suspected that the presence of metal surfaces (the condenser) might have affected the results by catalyzing polymerization. Therefore in order to obtain unquestionable results, a second experiment was then undertaken using a horizontal dish 20 cm. long and with Al electrodes attached to the vertical walls of the dish. The P.D. was approximately 60,000 volts. After 22 hours at room temperature there was found only 0.6% of the initial monomer present as a solid polymer. Further experiments are planned.

A New Method for the Determination of Rubber. E. Kheraskova and E. Korsunskaya. *Kauchuk i Rezina*, 7/8, 39 (1937). **SN-4.**

Determination of natural rubber in the presence of synthetic rubber is impossible by the presently known methods. Because of their similar solubilities it is well nigh impossible to differentiate between the two. The new method is based on the determination of CH_3 radical which exists in natural rubber, but not in synthetic rubber. Thus the CH_3 group is oxidized to yield acetic acid, and the latter is titrated. To this end an acetone extract of rubber is oxidized with chromic acid. Steam is passed to drive off the CH_3COOH. The distillate is collected and titrated. By this method the results obtained for a smoked sheet were 95.3-96.5% of hydrocarbon (according to Kemp, the value is 93.17%). Further work is being done to perfect this method.

Determination of Volatile Components in the Air Where Synthetic Rubber Is Produced. E. Peregud. *Kauchuk i Rezina*, 7/8, 63-70 (1937). **S-18.**

During the production of synthetic rubber from acetylene a number of volatile toxic substances are given off into the air, including: acetylene, monovinylacetylene, divinylacetylene, and chloroprene. The author has worked out a system for determining the presence of these substances in samples of air. The determination of any of these substances consists in obtaining the individual component free of admixtures of other components as well as of CO_2 from the air, then burning it, and determining the CO_2 produced in consequence. The CO_2 from the air was removed by the usual means of chemical analysis. In determining acetylene, mono- and divinylacetylene were absorbed in an 80% H_2SO_4 solution. For determining divinylacetylene, monovinylacetylene and acetylene were absorbed in an alkaline solution of mercuric cyanide (a solution of 2*N* $Hg(CN)_2$ in 5% NaOH). The monovinylacetylene was determined by difference. The CO_2 resulting from the combustion was absorbed in $Ba(OH)_2$, and the difference in the titer of the latter was determined. Chloroprene was determined by absorbing it from the air in a 96% alcohol. The alcoholic solution was carefully burned by placing it in an alcohol lamp, avoiding a smoky flame. The combustion products, CO_2 and HCl, were carefully absorbed in a 50% NH_4OH solution, and the Cl ion in the latter was determined. A control was run to determine free HCl in the air. In case dichlorobutene is present, it should be determined separately. It is readily separated from chloroprene by saponifying the former with an alcoholic solution of an alkali, during which chloroprene remains unaffected.

(To be continued)

New Information on Shore Durometer

In a paper presented before the A.S.T.M. meeting in Pittsburgh and published in the August *A.S.T.M. Bulletin*, Rolla H. Taylor, of the Bureau of Standards, reported on the manner in which the readings of the Shore durometer varied with time for 16 different compounds of natural and synthetic rubbers. The data were obtained from motion pictures showing a durometer and a stop watch in the same field of view. To eliminate the personal factor the durometer was mounted in a frame and pressure was applied by dead-weight loading. The results indicated both the necessity and the practicability of specifying that measurements be taken at a definite time after the application of the durometer to the specimen. The results also indicated the possibility of using readings taken at two different times as a rough measure of the relative creep of different rubbers.

"The Second Mile"[1]

The 1943 Goodyear Lecture

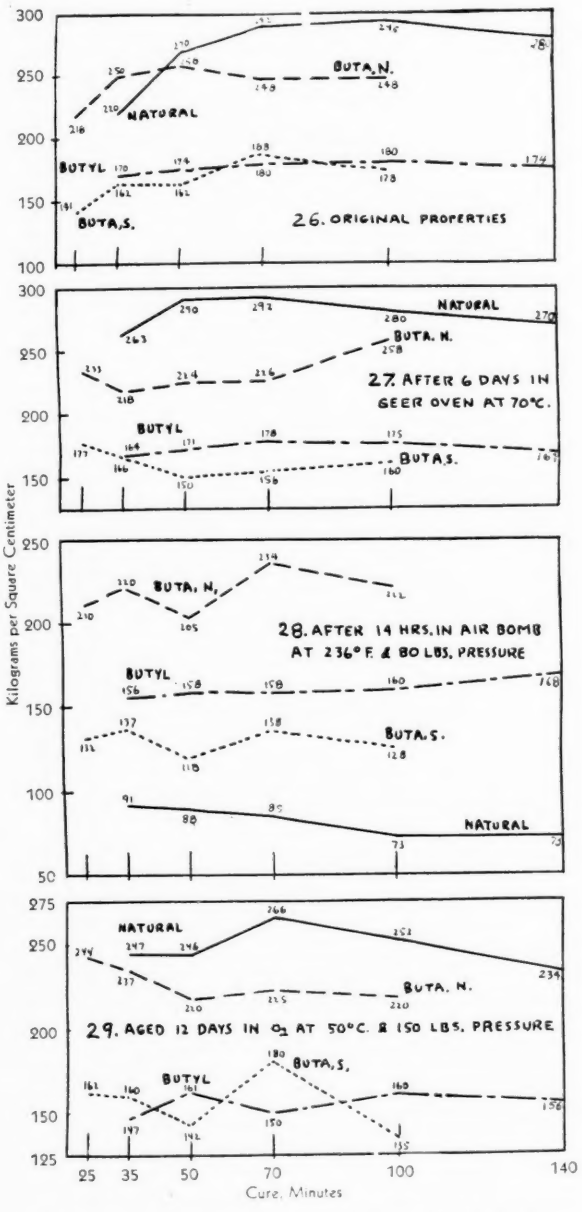
L. B. Sebrell[2]

THE 1943 Goodyear Lecture, because of its length, is being presented in three parts. This concluding installment treats of tread compound properties and also presents a summary of the entire lecture. EDITOR.

Properties of Tread Compounds

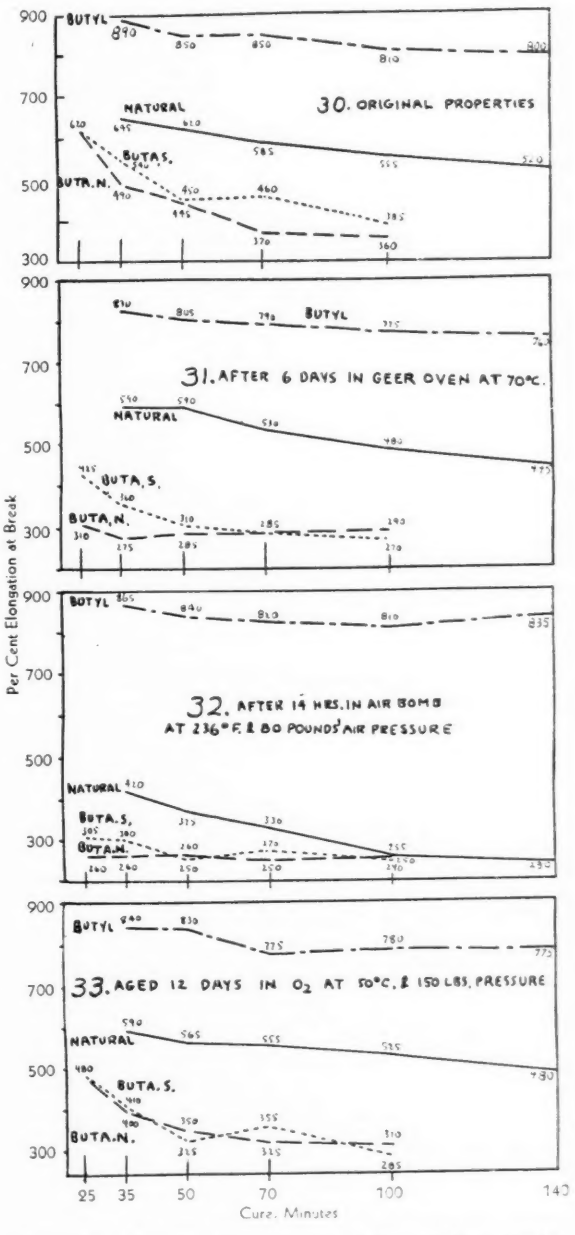
Thus far we have considered the rubbers in pure gum compounds (that is, without loading). The following data show the effects of channel black loading on the rubbers. Original data for channel black loaded stocks are presented in Figure 26. Butyl and butadiene-stryene are of the same order and give lower results than butadiene-acrylonitrile and natural rubber, the latter of which is slightly higher. All compounds have approximately the same rate of cure and after the optimum is reached remain flat curing over the range.

[1] Presented at the A. C. S. spring meeting at Detroit, Mich., Apr. 15, 1943.
[2] Manager, research and new products, Goodyear Tire & Rubber Co., Akron, O.


26. ORIGINAL PROPERTIES
NATURAL
BUTA. N.
BUTYL
BUTA. S.
27. AFTER 6 DAYS IN GEER OVEN AT 70°C.
28. AFTER 14 HRS. IN AIR BOMB AT 236° F. & 80 LBS. PRESSURE
29. AGED 12 DAYS IN O2 AT 50°C. & 150 LBS. PRESSURE
Kilograms per Square Centimeter
Cure, Minutes

Figs. 26-29. Tensile Characteristics of Channel Black Stocks

	°F. Cure	Parts Loading		°F. Cure	Parts Loading
Natural	260	50	Buta. S.	290	50
Buta. N.	260	50	Butyl	310	60


30. ORIGINAL PROPERTIES
NATURAL
BUTA. S.
BUTA. N.
BUTYL
31. AFTER 6 DAYS IN GEER OVEN AT 70°C.
32. AFTER 14 HRS. IN AIR BOMB AT 236° F. & 80 POUNDS AIR PRESSURE
33. AGED 12 DAYS IN O2 AT 50°C. & 150 LBS. PRESSURE
Per Cent Elongation at Break
Cure, Minutes

Figs. 30-33. Elongation Characteristics of Channel Black Stocks

	°F. Cure	Parts Loading		°F. Cure	Parts Loading
Natural	260	50	Buta. S.	290	50
Buta. N.	260	50	Butyl	310	60

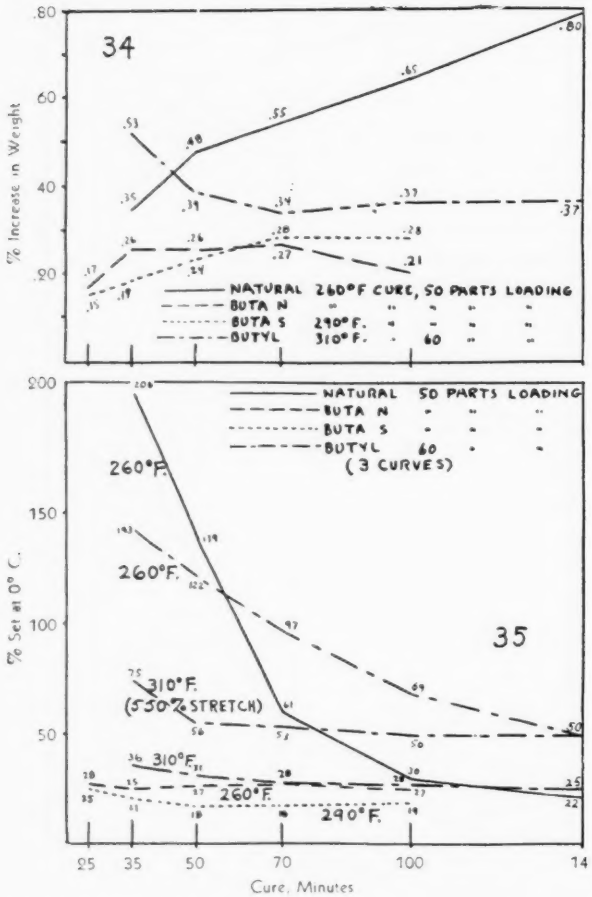


Fig. 34. Weight Increase in Channel Black Stocks after 12 Days in Oxygen at 50° C. and 150 Pounds' Pressure

Fig. 35. Zero Set in Channel Black Stocks at 300% Initial Stretch (Cures in ° F. on Each Curve)

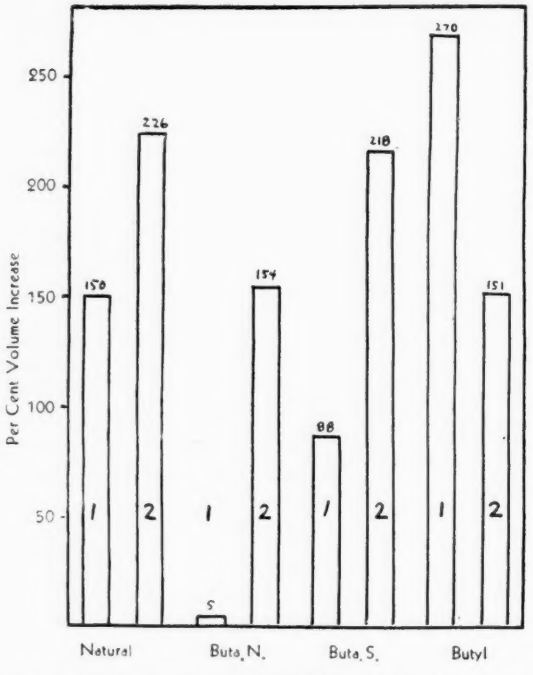


Fig. 36. Volume Increase of Channel Black Stocks after Seven-Day Swelling in (1) Octane Gas and (2) Benzene

A comparison of Figures 26 and 16[3] illustrates the effect of channel black in these synthetics. Butadienes acrylonitrile and styrene and Butyl rubber show a large increase in tensile, and the Butyl range of cures is smoothed out. There is some increase in the tensile of natural rubber, but it is not nearly so great as for the synthetics.

Tensile aging data for the channel black loadings are presented on Figures 27, 28, and 29. Figure 27 represents the Geer oven aging for six days at 70° C. It shows no great change for any of the rubbers over the originals. Figure 28 presents the air bomb aging data. This was run for 14 hours at 236° F. and 80 pounds pressure. It shows natural rubber to have fallen off considerably over the originals; while Butyl and butadiene-acrylonitrile show increases. Butadiene-styrene is unchanged. Figure 29 shows all rubbers to decrease correspondingly in tensile after 12 days in the oxygen bomb at 50° C. and 150 pounds pressure.

Original and aging characteristics of the elongations on the channel black loadings are given in Figures 30 to 33. The original data on Figure 30 show Butyl to have the highest elongation, followed by natural rubber. Both of these are comparatively flat over the range. Butadiene-acrylonitrile and butadiene-styrene are of the same order and are the lowest of this series. There is a drop in their elongation after 25 minutes, after which they remain flat through 100 minutes.

Natural and Butyl rubbers are unaffected by the six-day Geer oven test, as represented in Figure 31, but there is a drop from the original data for butadienes acrylonitrile and styrene. Natural rubber shows a decided decrease in elongation after 14 hours in the air bomb at 236° F. and 80 pounds pressure (Figure 32). Butadiene-acrylonitrile and butadiene-styrene also decrease, but not so much, while Butyl is unchanged.

Figure 33 shows the elongations after 12 days in the oxygen bomb at 50° C. and 150 pounds pressure. Natural and Butyl rubbers are unaffected; while there is a slight decrease in the acrylonitrile- and styrene-butadienes.

Figure 34 shows the weight increase after 12 days in the oxygen bomb of the channel black loaded rubbers over a range of cures. As in the case of the pure gum stocks (Figure 24[4]), natural rubber picks up considerably more weight owing to oxidation than do the synthetics. Whereas Butyl rubber was outstanding in this respect in a pure gum stock, it is now replaced by butadiene-acrylonitrile and butadiene-styrene, both of which have lower weights.

Figure 35 represents the % set at 0° C. of the four rubbers. The synthetics, when properly cured, were much less affected by this test than was natural rubber. Butyl rubber cured at 260° F. gave results similar to natural rubber, but showed a marked improvement when cured at 310° F.

The % increase in volume of the channel black compounds after seven days immersion in 100 octane gasoline and in benzene is given in Figure 36. Butyl rubber is inferior to natural rubber in 100 octane gasoline; while butadiene-styrene is 50% better. Butadiene-acrylonitrile shows up as best of these synthetics. Butyl rubber is equivalent to butadiene-acrylonitrile in benzene; while

[3] India Rubber World, Aug., 1943, p. 455.
[4] *Ibid.*, p. 456.

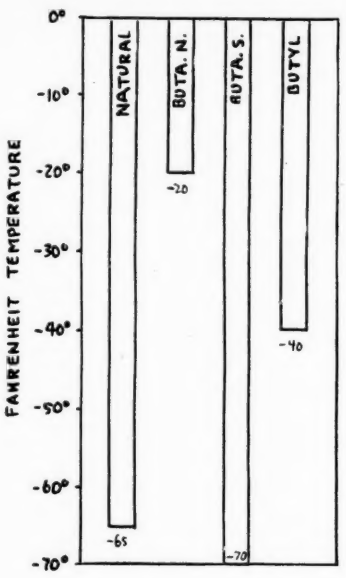


Fig. 37. Brittle Point of Channel Black Stocks

both butadiene-styrene and natural rubber give 70% higher values. The resistance of the butadiene-nitrile rubber to organic solvents has been of considerable value in the fabrication of military equipment.

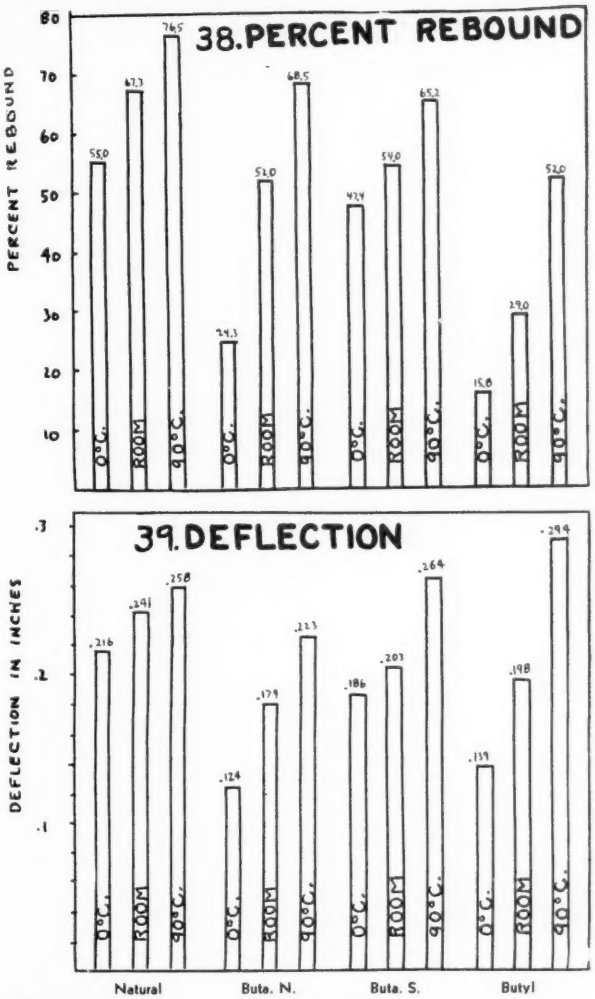
The brittle points of the four rubbers are represented in Figure 37. This shows butadiene-styrene to be the equivalent of natural rubber from the standpoint of flexibility; whereas the butadiene-acrylonitrile is much less able to withstand low temperatures. Butyl rubber falls midway between these two extremes.

Figures 38 and 39 illustrate the rebound and deflection of the channel black stocks at 0° C., room temperature, and 90° C. Natural rubber shows the highest rebound values over the range, and Butyl the lowest. Butadiene-acrylonitrile and butadiene-styrene give equivalent values at room temperature and at 90° C., but the styrene rubber is considerably higher at 0° C. The synthetics show more improvement in deflection as the temperature is increased than does natural rubber. This improvement is outstanding in the case of Butyl rubber. Butadiene-acrylonitrile becomes progressively higher over the range; while there is also a decided increase between room temperature and 90° C. for the styrene rubber.

Figure 40 shows the effect of testing the four stocks by means of the angle abrasion machine. All of the synthetics are approximately twice as resistant to abrasion as the natural rubber compound.

Figures 41 and 42 illustrate the tear resistance of the channel black stocks at room temperature and at 246° F., respectively. In both cases natural rubber is superior to the acrylonitrile and styrene rubbers; while in each case Butyl rubber is superior to natural.

Figure 43 represents the flex life of the channel black compounds as determined by means of standard punched strip tests run at 0-116% stretch at 370 cycles per minute. The superiority of Butyl rubber is outstanding, and natural rubber shows up much better than the acrylonitrile or styrene butadienes, which are very poor. The effect upon the flex life of changing acceleration is important, and an example is given in Table 7 to illustrate this. Table 7 shows the effect of flexing a natural rubber-Captax stock as compared with GR-S rubber using Captax and also an accelerator of a special type. A pierced groove



Figs. 38-39. Rebound and Deflection of Channel Black Stocks

test was made. This is not strictly comparable to the flexing test previously discussed. Here again the results are given in minutes; and while the change in accelerator has made but little difference at room temperature, there is a marked improvement at 200° F. for GR-S.

TABLE 7. COLD VS. HOT FLEX TEST

	Flex Life, Min.			
	Natural Rubber-Captax		GR-S	
			Captax	S2164
Room Temp.	70/275	400	25	25
	140/275	400	15	35
200° F.	70/275	600	2.3	4.0
	140/275	450	1.8	8.0

TABLE 8. COMPARISON OF SYNTHETIC RUBBERS IN FLEXOMETER TEST (STATIC COMPRESSION 6%)

	Temperature Rise ° C. at Amplitude of:	
Type of Rubber	1/16-Inch	3/32-Inch
Natural	49.5	70.5
Butyl	78.5	102.5
Nitrile	77.0	96.0
Styrene	71.5	90.5

Table 8 gives a comparison of synthetic and natural rubbers on a flexometer test under a static compression of 6%. The temperature rise between amplitudes of 1/16-

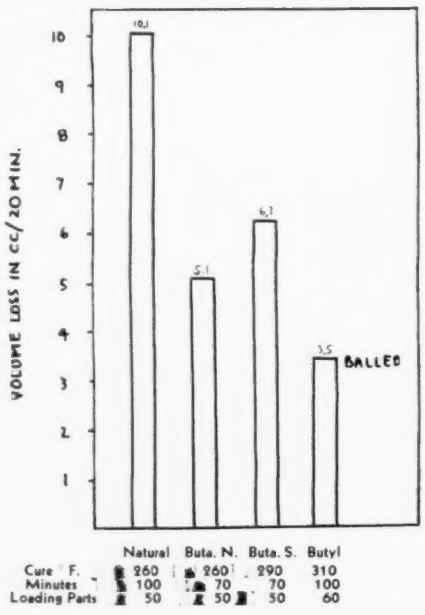


Fig. 40. Angle Abrasion of Channel Block Stocks

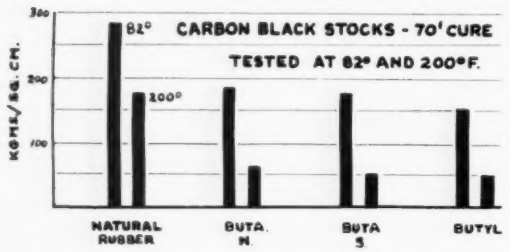


Fig. 44. Effect of Temperature on Tensile Strength

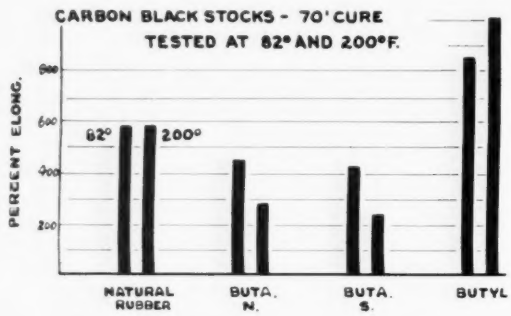
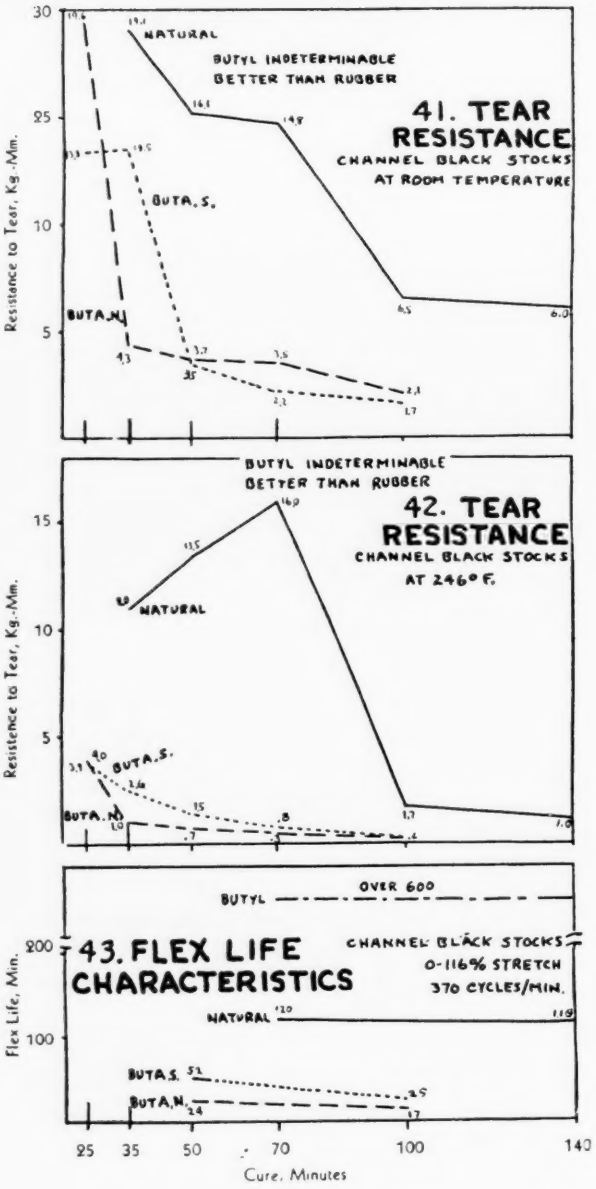


Fig. 45. Effect of Temperature on Elongation



Figs. 41, 42, and 43

	° F. Cure	Parts Loading		° F. Cure	Parts Loading
Natural	260	50	Buta. S.	290	50
Buta. N.	260	50	Butyl	310	60

inch and $^{3}/_{32}$-inch is approximately the same: namely, 20° C. for each rubber. Natural rubber has the lowest temperature for each amplitude; while the synthetics are approximately 20° higher.

Synthetic rubber compounds have been known to give very low values when tested at elevated temperatures. The four stocks in question were tested at 82° and 200° F. The tensile results are shown in Figure 44. The natural rubber had a tensile of approximately 280 kilograms per square centimeter at 82° F., whereas at 200° F. it had dropped only to approximately the same level as the original tensiles of the synthetic rubbers. These, in turn, had lost tensile strength at 200° F. until they had little more than 50 kilograms when tested at this temperature. This is undoubtedly a very serious defect in the present type of synthetic rubber and is something which should be corrected if possible.

When tested at 82° F. and 200° F., the elongations (Figure 45) of natural rubber are unchanged, while the butadiene synthetics decrease approximately 150%.

Summary

The results of the foregoing data may be briefly summarized as follows:

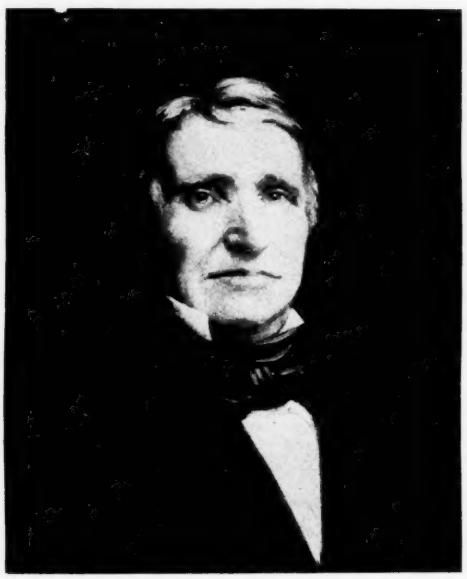
1. Synthetic rubber of good physical properties can be made, and in many respects it is fully equal to natural rubber; in others, synthetic rubber, as it is presently de-

(*Continued on page 569*)

The Cradle of the Rubber Industry[1]

Leonard Smith[2]

ONE hundred and four years ago Charles Goodyear made the discovery from which the great rubber industry of today directly stems. Naugatuck, Conn., the little village where Goodyear grew up, was the scene of the first manufacture of vulcanized rubber shoes. Its historic plant has always been and now, as a unit of the United States Rubber Co., is today the greatest rubber footwear enterprise in the world.



Charles Goodyear, the Discoverer of Vulcanization, from a Painting by Miss F. Chamberlin

Naugatuck, then known as Salem Bridge, was no different from the many other Connecticut manufacturing villages which had grown up along the banks of every river in the state, when, in 1805, Amasa Goodyear removed thereto from New Haven and started the manufacture of the first pearl buttons made in America. The Goodyears lived in an old frame dwelling on North Main St. in Naugatuck, known as the "Thomas Hartle Home." This house was built in 1753 and, although considerably altered during the passage of years, it is still standing today.

Amasa Goodyear, fourth generation in direct descent from Stephen Goodyear, deputy governor of the New Haven Colony, invented the steel fork, and it was thus that his eldest son, Charles Goodyear, came to enter the hardware business. Young Charles removed to Philadelphia in 1826 to establish the hardware business there, but after some years of successful operation the firm failed, and he began to seek new fields of endeavor.

The story of how Charles Goodyear became interested in rubber and his intense sufferings during the years that he sought the secret of vulcanization is well known and will not be dwelt upon here.

The momentous discovery was made in Woburn in January, 1839, and the ensuing months were devoted to

United States Rubber Co.

Goodyear's Early Home at Naugatuck

feverish efforts to produce some worthwhile samples of vulcanized rubber with which he might interest possible financial backers. He was "flat broke", as usual, and having exhausted every possible source for a loan in his immediate vicinity, he wrote to his brother-in-law, William de Forest, at Naugatuck, who sent him $50.

The Industry's Pioneer Families

William de Forest was a woolen manufacturer and just

McLaughlin Aerial Surveys

Present Footwear Plant of U. S. Rubber at Naugatuck, Conn.

[1] This article is copyrighted by United States Rubber Co., 1230 Sixth Ave., New York, N. Y.

[2] Business Research Department, United States Rubber Co.

about the foremost commercial genius in Naugatuck. It is largely due to his acumen that the roots of the rubber industry were so firmly established there. Emmet A. Saunders, who was born in Naugatuck and grew up to become superintendent of the footwear plant, penned the following word-picture of the two personalities. . . .

"Here was de Forest, a man of immense energy, fine bodily presence, not much education but with a tremendous faculty for trading and swapping. He was my 'beau ideal' of a 'fine old gentleman.' Large frame, fairly pleasant face (red, red, very red) buff waistcoat, tail coat and brass buttons and tall hat, usually brown with long furry glistening nap, very shiny. He always spoke of Goodyear with a wholly loving, but half contemptuous accent, as if he were a dearly beloved *'enfant terrible'* that should not be held responsible for anything except to be his own blessed self.

"And there was Goodyear, a dreamer, reaching for the moon, careless about such small and entirely material things as food, shelter and clothing for himself and family. He would be dependent for these upon any friend. He would give any one anything he had if they wanted it more than he did just then, and he would take from any one, borrow from any one, not because he was mendicant or 'dead beat' but because these things were of little importance and sometime 'when his ship came in' he would fix it all up, immaterial and temporary! De Forest fed and housed him and his family when they had no other refuge. He was not the man to keep account and score up the items—but when Goodyear had anything that could be sold or traded because of de Forest's competence and Goodyear's incompetence, de Forest would take hold and 'help.'"

Charles T. de Forest, son of William, relates the circumstances of the lasting of the first vulcanized rubber shoe in these words. . . .

"It was as this: Mr. Goodyear, the inventor, Mr. Milo Lewis, Mr. Samuel J. Lewis and Mr. William H. Elliott of New Haven met in my late father's woolen factory office in Naugatuck, Mr. Goodyear having provided the materials and lasts for the purpose of vulcanizing a rubber shoe on a last.

"Mr. Goodyear had brought with him his oldest daughter, my late wife, of blessed memory, with materials, and there she made the first pair of overshoes, afterwards vulcanized in a little shop just above the present grand plant of the Goodyear's Metallic Rubber Shoe Co."

The alliance between Eleanor Goodyear and Charles de Forest, above noted, brings up the interesting point that all of these rubber pioneers were interrelated. William de Forest's second wife was Harriet, sister of Charles Goodyear; he thus became son-in-law to Amasa Goodyear and brother-in-law to Charles. De Forest's mother, Clarissa, became the third wife of Daniel Beecher, and their daughter, Clarissa, married Charles Goodyear. Milo Lewis having married Susan, another daughter of Daniel Beecher (Susan being a half sister of Clarissa) he and Charles Goodyear also became brothers-in law. Samuel J. Lewis was the son of Milo.

The Lewis family was second only to de Forest in its commercial enterprise, and one of the most astounding documents ever brought to light is the "Lewis Family Agreement" which reads as follows:

"Articles of agreement between Milo Lewis, Thomas Lewis, Sam J. Lewis, and Wm. B. Lewis of Naugatuck.

"First: In prosecuting all the varieties of business in which the above named parties may be engaged, there shall be no separate or private interest whatever except the clothing for each one's self and family.

"Second: Each of the above named parties shall be under a bond of ten thousand dollars to re-deed to Milo Lewis or his heirs all the fast property and reconvey all the movable property received from him or that may be in their possession through the influence of business at the present or any future time by receiving from him or his executor or administrator the notes that they have given for such property amounting to a little more than Thirty Thousand Dollars.

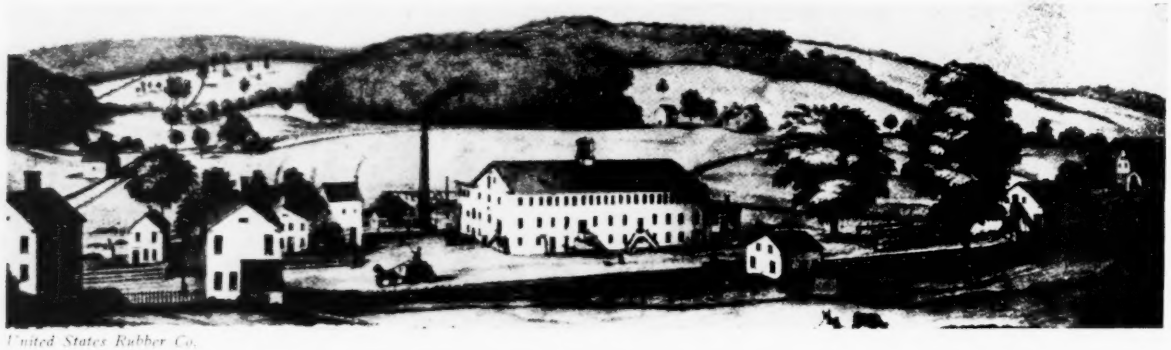
"Third: Each family shall be sustained from the results of the business in which they are respectively engaged and there shall be no separate account kept for such expenses for clothing; and for that each one shall keep a particular account and charge himself with the expenses of the same for himself and family.

"Fourth: It shall be the duty of Milo and Wm. B. Lewis to superintend and take care of the farming business of said concern, it shall be the duty of Thomas Lewis to take care of the Cotton Mill now owned by said concern, and it shall be the duty of Samuel J. Lewis to superintend the India Rubber Shoe business in which he is now engaged, and each party shall pursue perseveringly and faithfully their duties in the several stations which they occupy.

"Fifth: All important transactions in which anyone or all of the parties wish to engage in aside from their regular business shall be submitted to the Company and before engaged in shall receive the approbation of a majority of the Company.

"Sixth: All the results of the various branches of business on which the said Lewis's shall be engaged shall be appropriated to the payment of debts due from Milo or Thomas Lewis and be applied to increase business operations in the way and to the object that a majority of the Company shall deem most conducive to the interest of the whole concern.

"Seventh: The business at the Cotton Mill shall be done in the name of Thomas Lewis at the Shoe Shop in the name of Sam. J. Lewis, on the farm in the name of Milo and Wm. B. Lewis and Milo and Wm. B. Lewis shall indorse for each of the other concerns as far as may be necessary."



United States Rubber Co.

First Plant Erected by Goodyear's Metallic Rubber Shoe Co.

The First Footwear Plant

The rubber company commenced business in September,

1843, under the name of Samuel J. Lewis & Co. The avowed purpose was "the manufacture of india rubber shoes and other fabric made from that material, under the privilege of Charles Goodyear's patent for improved metallic rubber." Goodyear had applied for his patent on December 6, 1841, and had evidently spent the intervening time in continued experiments to render his process workable. He had issued a license to manufacture footwear to the company on September 12, 1843, even though his patent was not finally issued until June 15, 1844. A ledger entry of January 13, 1845, details the first payment made to Goodyear for royalties. The entry reads:

Charles Goodyear	Cr.	
By tax on making 21813 pair)		
rubber O'Shoes. Made from)		
Septr. 1843 to 1st Jany. 1845)		
@ 5¢ pr.)		1090.65

Goodyear, of course, was not active in the operation of the business. He did experimental work in the factory and was busy on a dozen new inventions as soon as his "metallized gum elastic" was an assured success. His correspondence with the company was largely devoted to technical matters. A number of original letters have been preserved of which a specimen is reproduced herewith. The letter reads:

New York, May 8th/45

"Samuel J. Lewis, Esq.

"Dear Sir

"Inclosed is a piece of gum said to be free from smell, will you please make me immediately some Samples of Shoes from any Gum either all Litharge or all Lead, which has lampblack in the surface. This you can do (if there is none on hand) by dissolving in pure Camphene some of the same sheet and giving a coat of it with lampblack. After heating soak them 3 days in one part Nitric acid and 3 parts water. The cloth in the heels and insole must be completely protected waterproof edges and all or the acid will destroy it. All this being done you will get something free from smell as this Sample is a jet black which I think will stay Black. You know I have had a long experience.

"Please try the experiment.

"Yours Truly

"(Signed) Charles Goodyear"

An interesting sidelight on the carefulness of the Yankee entrepreneur is provided by article eight of the company agreement which reads:

"It is further understood and agreed that the agent, Samuel J. Lewis, shall furnish himself with a horse and wagon to be kept at his own expense for his use when in the service of the Company. When at home he is to be at the expense of keeping himself and when absent on business for the Company his expenses are to be borne by the Company."

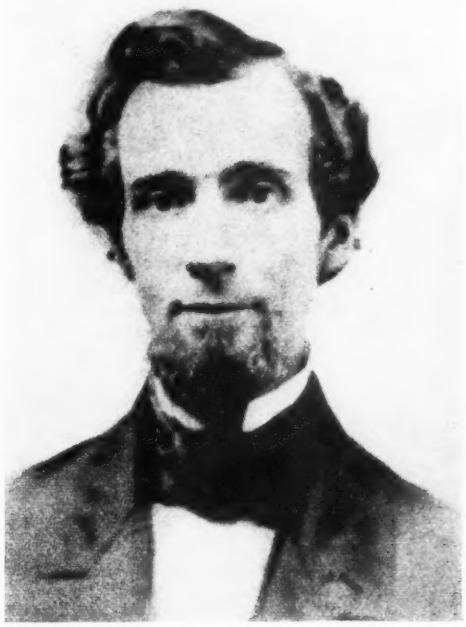
On January 9, 1845, the business was reincorporated under the name of Goodyear's Metallic Rubber Shoe Co., and 18 days later the first stockholders' meeting was held at Peck's Tavern in Naugatuck. They were just four in number, and all were named directors, the same four men who had witnessed the lasting of the first shoe—de Forest, Elliot, and Samuel J. and Milo Lewis.

Rubber Gloves and Clothing Added

The following year, 1844, the Litchfield India Rubber Co. was established at Litchfield, Conn., about 20 miles north of Naugatuck "for the purpose of manufacturing and selling india rubber gloves and mittens and other india rubber goods." The moving spirit in this enterprise bore the curious name of Barzilla Arntz. Apparently the enterprise met with some success for it soon attracted the attention of William de Forest, and within a year we find his name added to the board of directors, and in 1846, Charles Goodyear was likewise elected. In 1847 the Litchfield company was reincorporated under the name of "Goodyear's India Rubber Glove Manufacturing Co." with a capital of $6,000 and removed to Naugatuck, directly across the street from the footwear company. Some interesting light on the conditions of work and remuneration are afforded by the factory rules which were as follows:

"1. All employed in this factory to remain one year—or forfeit the amount hereinafter specified, and to make such kinds of work as the market demands.

"2. Each one is to allow 8 cents on each day's wages to be kept back till the end of the year when the full amount will be paid.



United States Rubber Co.

Samuel J. Lewis, First President of the Shoe Company and Brother-in-Law to Charles Goodyear

"3. If anyone leaves before the end of the year for any other reason than sickness to work anywhere, or marriage, the 8 cents per day reserved is to be forfeited and the balance of payment to be at the piece work price from the beginning.

"4. All to do a day's work anyway, and if work is needed very much to do all they can, and defer leaving for business, recreation, or visiting if possible till we get through the hurry.

"5. Damaged or bad work to be charged to the one making it, after or on the day's work.

"6. In work hours all to attend strictly to their work and give a good example of correct deportment to others, and where necessary to leave the factory for a longer time than 15 minutes, permission must be obtained from the Foreman, and always permission must be obtained for absence of half a day or more. All to be in their places when the bell stops ringing.

"7. We wish and expect all to attend some place of Public Worship on the Sabbath."

An agreement signed with Walter Z. Wooster, a shop foreman, read in part:

"Said Wooster of the first part agrees to perform faithful service for said G. I. R. Glove Mfg. Company for thirteen months from March 1, 1852, at the regular 11 hours per day, of Factory

work in the charge of the Girls work room, but in case said Wooster's service is needed in any other part of the factory, said Wooster agrees to render any and all assistance in the way of advice or work in his power, and generally to do all in his power to subserve the interests of said Company. In case of hurry or accident said Wooster agrees to work over the regular hours per day without additional compensation.

"Said Goodyear's I. R. Glove Mfg. Co. of the second part agrees to pay said Wooster for the above mentioned service at the rate of eight shillings per day, New England currency, generally at the end of each month, and in the month of May, 1853, to pay said Wooster the additional amount of 8⅓ cents per day for each day's service. Further said G. I. R. Glove Mfg. Company agrees to allow said Wooster in case of necessity occasional time to be absent to the amount of one half day without deduction of wages."

The glove company continued to make gloves and mittens without interruption until 1860 when it went into the manufacture of ponchos and rubber clothing. Emmet Saunders recalls that he saw coats on hangers "marching like a platoon of soldiers into the vulcanizer." The firm also made army blankets, coats, ponchos, and clothing during the Civil War. Footwear was not made at this plant until 1876. After the merger in 1892 both Naugatuck plants continued separate operations until they were combined in 1919.

Successful Development of the Industry

News of the successful development of the rubber industry was apparently slow in reaching New York. On October 11, 1845, the following article appeared in the *Weekly Courier & Enquirer* under "Correspondence."

"Charles Goodyear's Insoluble India Rubber Fabrics

"Among the many highly important discoveries of which this Country has so much reason to be proud, the one above mentioned will rank second to but one or two, either as regards the merit of the inventor or the beneficial results that cannot fail to follow from the almost unlimited extent of its usefulness.

"Hitherto that most valuable and extraordinary gum, known as the Caoutchouc, has been comparatively useless from its intractable nature; and particularly so, from being easily acted upon by many solvents, and even by the slightest change of temperature; but by the discoveries of Mr. Goodyear, all these advantages and impediments have now been entirely overcome, and in consequence an entirely new and original article, a new raw material, peculiarly adapted to the useful arts, possessing the singular combinations of elasticity, impermeability to air and hot water, and wholly unaffected by any solvent, or by any degree of temperature, is now added to the number of scientific discoveries. The management of Caoutchouc has hitherto baffled every one who has attempted to divest it of its solubility both in this country and Europe; it is therefore most gratifying to us that so important an invention should have emanated from an American.

"But there is a circumstance connected with these fabrics of Mr. Goodyear, which is deserving of especial notice, and gives to them an additional importance, inasmuch as they will greatly tend to the consumption of our great staple—cotton. We have in our office a piece of rubber carpet—the basis of which is cotton—and which we think cannot fail to be extensively used for this purpose. In all other articles capable of being made of these fabrics of Mr. Goodyear, where elasticity is not requisite, cotton forms a material in their composition; consequently, these being evidently very numerous, the demand of the great staple of our country must be essentially augmented.

"Since our attention has been directed to Mr. Goodyear's great invention, we are more and more struck with its importance in every point of view; and we may mention of the fact that the *Stephen Whitney* has a top-sail made of the fabric of Mr. Goodyear, which has been used during one voyage and has answered every expectation of the inventor.

"Mr. Goodyear is introducing his goods into market through the Naugatuck Company at Naugatuck, Conn., Mr. Tomlinson of Newtown, Conn., at the old Roxbury India Rubber manufactory, Mass., and other establishments and is protected in the just reward of his indefatigable exertions and perseverance, which have incessantly occupied him for a period of twelve years, by the security of patents taken out in this country, Great Britain and France; and although, as is generally the case, attempts are made to rob an inventor of his just rights, we are informed that the title of Mr. Goodyear is so just, and so well established, that he has little to apprehend from the arts and chicanery of those who may seek unfairly to deprive him of the fruits of his ability, industry, and perseverance. Several manufacturers, who were unaware of the patents of Mr. Goodyear, have, as soon as they were pointed out to them, applied to him for licenses under which many are now pursuing a very lucrative and respectable business."

The Naugatuck company referred to evidently means the Naugatuck India Rubber Co. established in July, 1844. This concern reserved to itself the manufacture of "articles of any description composed in whole or in part of Goodyear's India rubber preparations, according to any invention or discovery already made or which may hereafter be made. Thomas Lewis was the first president, and Milo Lewis and William de Forest were among the directors. This plant finally became part of the footwear company.

Josiah Tomlinson, also referred to in the *Courier* article, was connected with the shoe plant. He was another relative of the pioneer families and one-time partner of Amasa Goodyear in the button factory.

Patent Troubles

The statement that Goodyear had little to apprehend from infringers was a pious platitude. The same journal had already carried advertising for rubber goods made by Horace H. Day and hurling defiance at Goodyear and all his claims. He was to become Goodyear's arch enemy and leader of the incredible fight to have the patent declared invalid. One of Day's advertisements contains this forthright statement:

"Among the advantages he claims in his mode of manufacture over that of Mr. Goodyear is freedom from sulphurous smell so inseparable from Mr. G.'s. The peculiar and exclusive property of retaining their elasticity, and the great increase of stiffness without additional bulk or weight. It is a common complaint among those who have used Mr. G.'s suspenders that they lose their elasticity after being worn a short time."

On June 27, 1845, Samuel J. Lewis addressed the following letter to Charles Goodyear, and the war was on.

"Naugatuck, June 27/,45

"Charles Goodyear, Esq.

"Dear Sir

"I am directed by our Board to communicate with you on the subject of the contract which gives us license to make shoes, etc. under your Patent. We are credibly informed that there are various establishments about the country, at which shoes are manufactured in large quantities upon the principle of your discovery. We are also informed that they are in the market and that contracts are made by dealers for large amounts of them this season. Under such circumstances you will be sensible that the rights and interests of our Co. are materially affected. We wish to prosecute the shoe business according to the contract. But in order to do that as you will perceive it will be necessary for you to protect us in the rights and privileges guaranteed to us in the agreement referred to. You will hardly expect our Co. to pay you for the privilege of making an article which others make freely with impunity and regardless of tax or license.

"Very truly yours,

"Goodyears M. R. Shoe Co.

"S. J. Lewis, Pt."

Thomas C. Wales, Inventor of the Cloth-Top Arctic

Things continued to get worse, and the upshot was the formation of the Goodyear Shoe Association by the licensees in 1848 to defend the patent. The members were: Goodyear's Metallic Rubber Shoe Co., L. Candee & Co., Hayward Rubber Co., Newark India Rubber Mfg. Co. and Ford & Co. Goodyear agreed to accept ½¢ per pair of shoes as royalty instead of 3¢, and the manufacturers raised the defense fund. Daniel Webster was secured by Goodyear's side and was opposed by Rufus Choate, and as everyone knows, the case was finally decided in 1851 in a complete victory for Goodyear.

The Shoe Associates continued as a sort of trade association with annual renewals of the agreement and with various new members admitted from time to time. Its function was to standardize styles and establish prices, but as early as 1853 the subject of a merger was broached, and a tentative agreement drawn up. As history shows, the attempt was abortive as were a number of attempts which followed in later years until the consolidation was finally achieved by Charles R. Flint in 1892.

Introduction of the Arctic

The invention of the cloth-top arctic in 1856 had a profound effect on the destiny of the company intrenching it still further in the lead in public preference. The inventor was Thomas C. Wales, a director of the company, whose history goes back to the very beginning of the rubber shoe industry as the pioneer importer of the native Brazilian shoes. In the year 1825, Mr. Wales, then a merchant in Boston, saw native rubber shoes brought in by sailors and had the idea of importing them as an article of commerce, which he proceeded to do, thus founding the extensive imported shoe business which flourished prior to the discovery of vulcanization. The Wales arctic became so important to the company that in 1878 the style "Wales-Goodyear Shoe Co." was adopted. Meanwhile Samuel J. Lewis had retired because of ill health and had been succeeded as president by James E. English. The latter was a noted Connecticut statesman, serving the state for three terms as governor and as Congressman and senator besides holding numerous other political offices. His association with the rubber company endured for 37 years, for 29 of which he held the office of president.

In 1890, George A. Lewis, son of the founder, who had joined the company as secretary in 1864, later becoming treasurer, was elected president and continued in office for some years after the formation of the United States Rubber Co. in 1892.

A cousin of Charles Goodyear, Edward B. Goodyear, continued the Goodyear association by becoming cashier of the company in 1878. He in turn was succeeded by a son, Clinton S. Goodyear, who remained with the company until his death in 1938.

"The Second Mile"

(*Concluded from page 564*)

veloped, shows serious deficiencies, particularly in its ability to give satisfactory results in pure gum stocks or to give good tensile strengths at elevated temperatures.

2. It may be concluded that while there is considerable work yet to be done in improving synthetic rubber to make it fully equal to natural rubber, the danger from an economic or military standpoint of a lack of rubber may be considered in a large measure to have been removed.

3. An accurate plan of attack to improve synthetic rubber further must certainly consist of the removal of cross linkages to as great an extent as possible. This may be only an hypothesis, but it is the one which at the moment seems to be the most satisfactory and toward which a great proportion of the development work now under way is directed.

4. Some radical change in the method of forming the rubber-like polymer will have to be developed before the qualities of the synthetic rubber will greatly improve beyond those outlined in this paper.

5. The comparison between the butadiene-styrene or -nitrile types of rubber and the Butyl-type rubber is interesting. While Butyl rubber is inferior in several respects to the other synthetic rubbers, it also excels these rubbers in certain respects. Since it is generally assumed to be more nearly a straight chain polymer, further development along this line would seem to be in order, and it also appears to be indicative of what may be expected from further research.

6. We believe that the type of rubber now being used in this country is equal or superior to that developed by any country in the world and that such development may, in time, make us independent so far as the supply of rubber is concerned.

Acknowledgments

The author wishes to acknowledge the valuable assistance of the members of the staff of the research laboratory of The Goodyear Tire & Rubber Co. in the preparation of this paper, particularly that of Drs. Leora Straka, A. M. Borders, and S. D. Gehman, and J. E. Fielding, R. S. Sanders, and G. H. Gates, as well as many others who have contributed to the preparation of this paper, and without whose assistance it would have been impossible to assemble the data presented in this lecture.

EDITORIALS

"For Want of a Nail . . . . ."

JUDGING from recent utterances of leaders of the industry and the Rubber Director's Office, the problems and headaches of the second phase of the rubber program, namely those of successfully and efficiently using our growing supply of GR-S rubber, are now very much occupying the center of the stage. It was announced in Progress Report No. 3 that in order to maintain essential civilian transportation, 5,000,000 synthetic rubber tires would have to be made during the last half of 1943 and 30,000,000 tires during 1944. Sufficient GR-S rubber will be available for this production, but it is apparent that of equal or even greater importance is the necessity of expanding tire manufacturing facilities and finding the necessary manpower to make the tires.

A great deal of the machinery and equipment for the manufacture of civilian tires has been either converted to the production of military tires or has been stored; while the floorspace it formerly occupied has been used for the manufacture of other war products such as guns, tank tracks, airplane parts, bullet sealing tanks, and many other essentials for the Armed Services. Although our output of war products has reached the proportions of a growing flood and the character of our enemies' warfare has changed from offense to defense, there is very little possibility that the production of war products can be cut back enough to convert any appreciable amount of equipment and manpower to the manufacture of civilian tires. Many of the tire builders not employed in the making of tires for the military have either been inducted into the Army or Navy or have long since gone into other war jobs.

Much work has been done to provide the necessary tonnage of synthetic rubber, and as much as possible has been done to establish the best methods for its use. In spite of intensive efforts on the part of the Rubber Director's Office and the industry in research and development on compounding materials, methods, and equipment, the general consensus of opinion appears to be that GR-S rubber cannot be handled with the same production efficiency as natural rubber, and since it is now our only rubber available in large quantities, the industry will be using it for some time to come.

The Rubber Director's Office recently requested the WPB for permission to expand tire manufacturing facilities to the extent of an estimated expenditure of $95,000,000. Approval for some of this expansion has already been granted, but there seems to be some hesitancy about approving priorities for materials to construct certain new tire plants which are necessary to meet the estimated tire production schedule. It was not many months ago that the same hesitancy was evidenced in allocating the necessary materials of construction to carry out the synthetic rubber plant construction program although it had been recommended and approved by the highest authorities outside the WPB. Let us have a prompt and complete approval of the tire expansion program at once in order that the growing volume of GR-S rubber coming out of the new plants may be converted into not only the rubber products necessary for the prosecution of the war, but for the maintenance of our civilian economy as well.

If we have an excess postwar production capacity for peacetime tire manufacture as well as for crude rubber production, it is simply the unavoidable cost of the war on the scale and under the conditions we have been forced to wage it. Jeopardizing the home front economy by permitting a breakdown of civilian transportation facilities during the next year or two might add to this cost many, many times and result in a lengthening of the conflict to a point where the loss due to the postwar idleness of a few wartime tire plants would be entirely insignificant.

Financing Synthetic Rubber Research

IN A TALK given in connection with the dedication of the new Goodyear Research Laboratory in June, Dr. Norman Shepard, of the American Cyanamid & Chemical Co. and the Office of the Rubber Director, brought out again the value and scope of fundamental research on synthetic rubbers. He emphasized the fact that the rubber industry had an opportunity which is not likely to present itself again in the near future of continuing a research program that has been carefully organized and well executed and suggested a tax of $\frac{1}{5}$-cent per pound of rubber consumed to finance the work after the Rubber Director's Office is dissolved. Another way the work might be financed at the beginning might be by the use of some of the $5,000,000 that the government was supposed to provide for research on synthetic rubber under the proposal made by the Standard Oil of N. J. in April when it turned over its Buna patent rights to the government royalty-free for licensing to everyone-for the remaining life of the patents.

The Cross-License Agreement (Buna Rubber) proposed by the Rubber Director and the Secretary of Commerce for execution between the Rubber Reserve Company and private corporations undertaking to aid the government's synthetic rubber program and submitted to the Attorney General for approval on July 28 by Donald M. Nelson, Chairman of the WPB, does not contain any reference to or provisions for the $5,000,000 fund for research on synthetic rubber. As far as can be determined, it has never been publicly announced that the government had agreed to increase the expenditure for synthetic rubber research to a minimum of $5,000,000 as mentioned in the original proposal. There is a need of an agreement between government and industry as to the source of such funds, after which the details of their use should be worked out. Opportunity sometimes knocks but once.

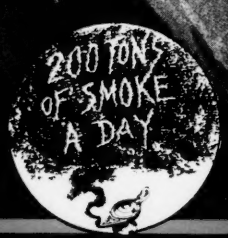
ר

FURNEX

BEADS *or* DENSE

A COLUMBIAN COLLOID

TENSILE, MODULUS AND RESILIENCE IN IDEAL SRF COMBINATION



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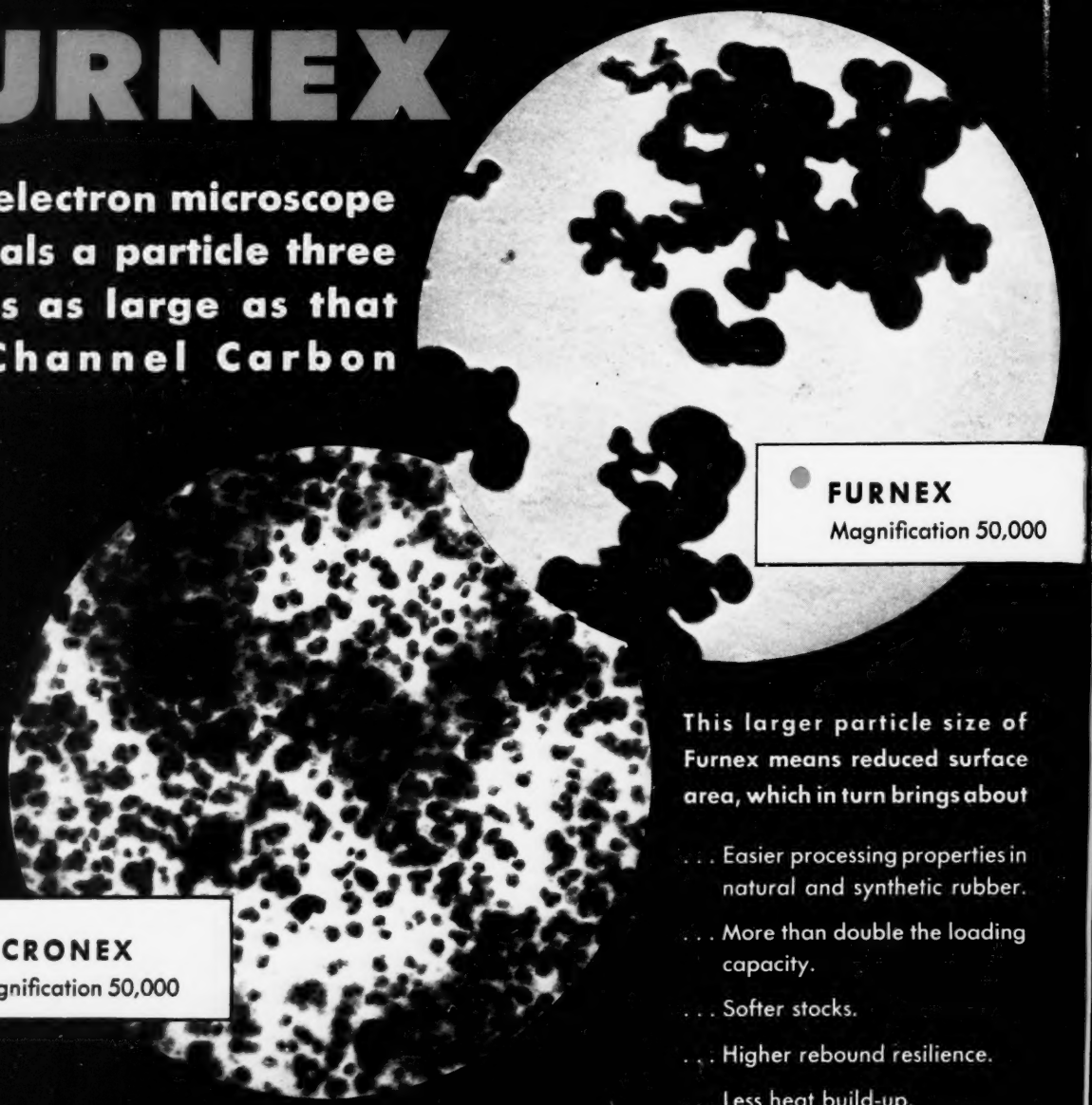

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. . . Easier processing properties in natural and synthetic rubber.

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. . . Higher rebound resilience.

. . . Less heat build-up.

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200 TONS OF SMOKE A DAY

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THE CURRENT CHOICE for all GR-S dynamic reinforcement. Statex compounds are cool running, flat curing and more resistant to cut growth.

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What the Rubber Chemists Are Doing

L. A. Group Outing

A MOST successful outing of the Los Angeles Group, Division of Rubber Chemistry, A. C. S., took place at the Uplifters Club, Santa Monica, Calif., July 24 and 25, which 85 members and guests attended. Prize winners included: *Best Dressed '49er*, L. Jung (U. S. Rubber) and V. Vodra (R. T. Vanderbilt); *Bingo*, S. Pike (T. A. Desmond & Co.), C. Lucas (Rubber Reserve), and A. Swanson (W. J. Voit Rubber Corp.); *Ping Pong*, B Snyder (Voit), R. Hirsch, and R. Hull (U. S. Rubber); *Golf*, W. Von der Reith (Sierra Rubber), J. Huff (U. S. Rubber), Mr. Lucas, and L. Smith (Lombard Smith Co.); *Tennis*, Mr. Bradford, H. Wendall (Southwestern Rubber), and P. Drew (Goodyear); *Badminton*, R. Short (Kirkhill Rubber), Mr. Vodra, A. S. DeWeese (Voit); *Horseshoe Pitching*, C. Wolters (U. S. Rubber), P. Parker (Voit), and W. Ketler (Voit); *Guessing Contest*, J. Gimian, J. Wildman (Commercial Rubber) and A. Legman (A. Legman Truck Co.); *Egg Throwing Contest*, W. Boswell (Thiokol Corp.), H. Legman (A. Legman), and Mr. Diresbaugh; *Raffle Prizes*, J. Holm, J. Gamble, and W. Emery.

The wide variety of attractive and useful prizes was possible through the generous contributions of the following organizations:

American Cyanamid & Chemical Co.; Arrowhead Lime Co.; Binney & Smith Co.; L. H. Butcher Co.; T. A. Desmond; Dill Mfg. Co.; E. I. du Pont de Nemours & Co., Inc.; Firestone Tire & Rubber Co.; B. F. Goodrich Co.; Goodyear Tire & Rubber Co.; C. P. Hall Co.; D. Hecht & Co.; J. M. Huber, Inc.; Hycar Chemical Co.; Kirkhill Rubber Co.; National Standard Co., Naugatuck Chemical Division, United States Rubber Co.; Reinke-Hiller & Amende, Inc.; H. M. Royal, Inc., (Los Angeles); H. M. Royal, Inc. (Trenton, N. J.); San Francisco Sulphur Co.; A. Schrader's Son; Sierra Talc Co.; Lombard Smith Co.; Stanco Distributors, Inc.; Thiokol Corp.; U. S. Rubber; R. T. Vanderbilt Co., Inc.; Western Insullated Wire Co.; Western Shade Cloth Co.; Charles T. Wilson Co.

New Flexible Tubing

A TRANSPARENT, flexible tubing for sub-zero applications, with a wide range of working temperatures for continuous operation (—60 F. to +188.6° F.), called Synflex FT-11, recently was placed on the market. The transparency of this material facilitates circuit and wire code identification and permits immediate inspection of soldered points or connectors without removal of the insulating sleeve. Synflex FT-11 has a dielectric strength of 1000 VPM. Another rubber-like synthetic for electrical insulation and many non-electrical applications is Synflex FT-22, which has a temperature resistance of 194 F. and a dielectric strength of 1200 VPM. Neither material will support combustion; both have excellent chemical resistance and low water absorption, and either can be blown over flexible or rigid metal conduit and used for waterproofing and sealing cable ends.

Temperature Correction Factors for Specification Tensile Testing of GR-S

MEMORANDUM

TO: Consumers of Synthetic Rubber

FROM: H. E. Simmons
Office of the Rubber Director

SUBJECT: Temperature Correction Factors for Specification Tensile Testing of GR-S

For your information we are pleased to show on the other side of this sheet a table of temperature correction factors for use in obtaining the tensile properties of GR-S according to the method prescribed in the Rubber Reserve Co. Specification for GR-S which states that tensile testing shall be done at 82° ± 1° F.

This table was prepared by the National Bureau of Standards from data obtained by them at five different temperatures, viz., 58°, 70°, 82°, 95°, and 110° F., on the standard Rubber Reserve Co. test recipe. The GR-S and all the compounding ingredients except the Bardol (the softener in use at the time the work was done) were supplied by the Research Compounding Branch of the Rubber Director's Office.

TEST RECIPE

GR-S (ORD No. 45)	100
EPC Black	50
Bardol	5
Zinc Oxide	5
Sulphur	2
Mercaptobenzothiazole	1.5
	163.5

Laboratory Press Cures at 292° F.
For Tensile and Elongation:—50 Minutes
For Modulus:—25, 50, and 90 Minutes

For Tensile Properties of Standard GR-S Recipe

In order to correct to 82° F. multiply the actual determined values for each of the three tensile properties by the factor corresponding to the temperature at which the tests were made.

TEMPERATURE CORRECTION FACTORS

Temperature	Stress at 300%	Tensile	% Elongation
60° F.	.96	.82	.91
62	.96	.84	.92
64	.96	.86	.93
66	.97	.87	.94
68	.97	.89	.94
70	.98	.90	.95
72	.98	.92	.96
74	.98	.94	.97
76	.99	.95	.98
78	.99	.97	.98
80	1.00	.98	.99
82	1.00	1.00	1.00
84	1.00	1.02	1.01
86	1.01	1.03	1.02
88	1.01	1.05	1.02
90	1.02	1.06	1.03
92	1.02	1.08	1.04
94	1.02	1.10	1.05
96	1.03	1.11	1.06
98	1.03	1.13	1.06
100	1.04	1.14	1.07
102	1.04	1.16	1.08
104	1.04	1.18	1.09
106	1.05	1.19	1.10
108	1.05	1.21	1.10
110	1.06	1.22	1.11

August 2, 1943.

Chicago Group Outing

THE Chicago Group, Division of Rubber Chemistry, A. C. S., held its annual summer outing at the Nordic Hills Country Club on August 14; about 100 men turned out for this successful affair. The Charley Muehlstein Trophy given to the man with the low gross score for golf was again won by J. T. Adams, of Sears Roebuck & Co., who having won this trophy for two years in a row is now in permanent possession of it.

About 90 of the members and guests played golf, and the rest enjoyed themselves on the lawns and in the Game room. Dinner was served, and J. Sheridan chairman of the outing, presented the many gifts which were made possible for the Group by the following list of donors. The outing committee consisted of J. Sheridan, New Jersey Zinc Co.; C. Wonder, Van Cleef Bros., co-chairman; C. Yoran, Wishnick-Tumpeer, Inc.; D. Huizenga, Inland Rubber Co.; and B. Stangor, Chicago Belting Co.

L. Albert & Son., American Zinc Sales Co., Bibb Mfg. Co., Binney & Smith Co., Carter Bell Mfg. Co., Chicago Belting Co., Chicago Cutting Die Co., Cleveland Liner Mfg. Co., Commerce Petroleum Co., Continental Carbon Co., Darling Co., T. A. Desmond & Co., Inc., E. I. du Pont de Nemours & Co., Inc., Eagle Picher Lead Co., Farrell Birmingham Co., Inc., General Atlas Carbon Division, George Genseke, Givaudan-Delawanna, Inc., Godfrey L. Cabot, Inc., Great Lakes Solvents Corp., R. W. Greef & Co., Inc., C. P. Hall Co., Herron & Meyer, J. M. Huber, Inc., Hycar Chemical Co., INDIA RUBBER WORLD, International Smelting & Refining, S. C. Johnson & Sons, Kraft Chemical Co., Marbon Corp., G. S. Mepham Co., Monsanto Chemical Co., Moore & Munger, J. Raymond Morath, H. Muehlstein & Co., Inc., National Rubber Machinery Co., National Standard Co., New Jersey Zinc Sales Co., Pequanoc Rubber Co., Philadelphia Rubber Works, Rex-Hide Co., *Rubber Age*, A. Schulman, Inc., Henry L. Scott Co., Stanco Distributors, Inc., Standard Chemical Co., Sun Oil Co., Thiokol Corp., Titanium Pigment Corp., United Carbon Co., Inc., U. S. Rubber Reclaiming Co., R. T. Vanderbilt Co., Wilmington Chemical Corp., Wishnick-Tumpeer, Inc., Xylos Rubber Co.

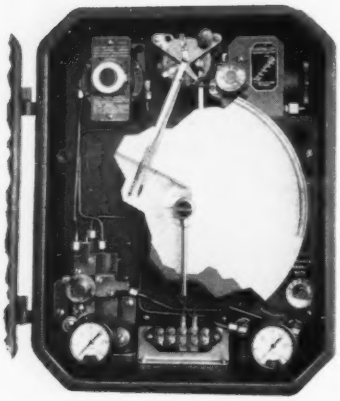
Pittsburgh A. C. S. Meeting

ALTHOUGH the Division of Rubber Chemistry, A. C. S., is to hold a separate meeting in New York on October 5, 6, and 7, there are some features of the September meeting of other Divisions of the Society that may be of interest to rubber chemists. Col. Bradley Dewey, Deputy Rubber Director, will speak before the general meeting of the Society on Wednesday, September 8, at Carnegie Music Hall on "The Synthetic Rubber Program—Present and Future", and Per K. Frolich, of the Standard Oil Development Co., will discuss in his Presidential address, "Petroleum—Past, Present, and Future."

L. M. Welch and W. E. Roseveare will present a paper before the Division of Cellulose Chemistry on September 9 on "Fibrillar Structure of High-Tenacity

(*Continued on page 583*)

New Machines and Appliances



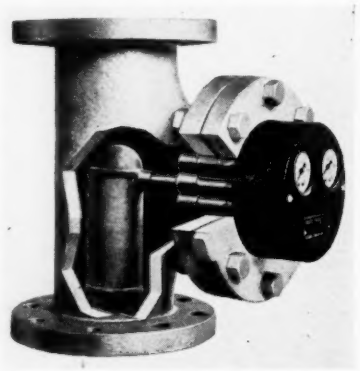
Automatic-Manual Unit for Process Controllers

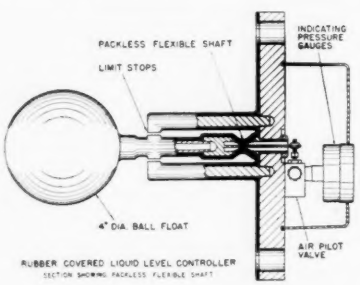
New Automatic-Manual Unit for Process Controllers

THERE are many improvements in the new automatic-manual control unit for process industries recently announced by Taylor Instrument Co., Rochester, N. Y. When the new unit is in a "manual" position, controlling air pressures are also applied to the idle mechanism of the Fulscope controller which is thus maintained in constant balance with the process. Control can be changed instantly from "manual" to "automatic" without causing process disturbances. In addition to the three usual positions, "automatic", "manual", and "service", this new unit contains a fourth step, "test." Set at "test", control is manual, but the full 20 psi. supply pressure is applied to the instrument mechanism to make possible its complete and accurate readjustment without disturbing the position of the controlled diaphragm valve. The new unit is designed to be installed within the case of a Fulscope single-duty recorder controller. It can be supplied already installed in new instruments, or it may be added to equipment already in the field, without the need of either drilling or tapping the Fulscope instrument.

Rubber Covered Liquid Level Controller

A NEW completely rubber or neoprene covered liquid level controller designed for installation in a standard rubber covered tee fitting, or for direct mounting in a tank containing corrosive liquids is now available. A rubber covered flexible steel shaft eliminates packing glands and bearings and provides a simple friction-free method of transmitting the float motion to an air pilot valve or micro-switch as required. The flexible shaft consists of a formed tube similar to a Bourdon. A flat lever inside this tube connects directly with the air pilot valve or micro-switch for controlling the liquid level. Operation is not affected by wide variations of pressure and temperature. The controller operates on the principle of force change due to buoyancy, rather than a float riding on a moving level, and sensitivity is such that a buoyancy change of less than 8 ounces will result in full travel of the diaphragm-operated control valve. This permits the use of a small four-inch diameter ball float and a short float arm approximately 5½ inches in length. Elliptical steel floats having ⅛-inch rubber covering are used where wider level changes are desirable. For high and low level cut-off or alarm, a micro-switch can be furnished in place of the air pilot valve. Rubber covered stops are provided to keep the flexible shaft well within its elastic limit. Moore Products Co.





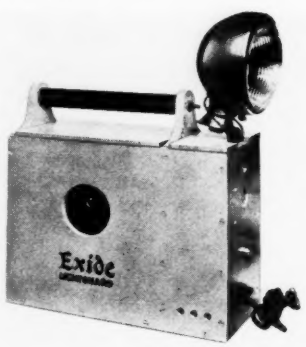
Rubber Covered Liquid Level Controller

Reusable Employe Identification Badge

A NEW badge unit that is reusable and tamper-proof and has been designed to cut the cost of operating an identification system, save time, and eliminate needless waste of material is available for use in war production plants. Most of these plants have an appreciable employe turnover and the new badge unit reduces the cost of employe identification because the badge parts can be used over and over again. The design also saves time by making possible quick changes of colored paper inserts when shifting employes to different departments. Changes of photographs and color designations can be accomplished only with a special tool furnished by the manufacturer. The badge parts, photograph, and color designations (if any) are locked with a metal rivet by means of a special tool. When sealing, the closing die engraves an identifying letter of the firm name on the face of the rivet, providing the user with a special seal. To dismember the unit, the opening die breaks through the rivet, destroys the seal, and renders the badge parts loose. American Emblem Co., Inc.

Emergency Lighting Unit for Wartime Service

THE new Exide Lightguard emergency lighting unit requiring no fixtures or wiring other than plug-in connections to the A. C. supply has been announced. The unit is self-contained and weighs only 47 pounds so that it can be easily moved from place to place during a fire, accident, explosion, or air-raid, for use in rescue work. It throws a beam of light 50 feet wide a distance of 150 to 200 feet, covering an area of 7,500 square feet from a sealed-glass type, prefocused auxiliary driving lamp (Mazda 4010) similar to those used on modern automobiles. The unit operates instantly and automatically without a hand touching a switch. The only maintenance required is the occasional adding of water. Recharging of the three-cell Exide, type KZHGR-7 battery is done automatically by a trickle charge, and the state of charge is clearly indicated by pilot balls. The emergency unit has been designed to meet the need of a source of light in war plants, arsenals, ordnance plants, shipyards, and factories where wartime activity has increased the potential dangers resulting from power-line failure, fires, etc. When the lights go out, and machinery continues to run on its own momentum, the Lightguard, by automatically switching on a broad beam of light, helps reduce the accident hazard, particularly in those plants where men and women unfamiliar with machinery are working. The Electric Storage Battery Co.



Lightguard Emergency Lighting Unit

UNITED STATES

Tire Industry Expansion Planned; Rayon and Cotton Cord Making Facilities Also Involved

Following on the heels of the campaign late in July to impress on the civilian motorist the necessity of conserving his present tires by recapping in time, the tire industry and the Office of the Rubber Director have made it known during August that an expansion of tire making facilities involving an expenditure of $95,000,000 will be required, in order to convert the new supply of GR-S into tires for civilian drivers now that military needs are pretty well taken care of. In requesting the necessary priorities for new machinery, the Rubber Director's Office has pointed out to the WPB that most of the available tire manufacturing equipment is being used for the production of tires or other wartime rubber products for the Armed Services, and also of equal importance is the fact that the use of GR-S in tire production requires more time, more equipment, and even better equipment than when natural rubber was used. A further complication is the shortage of skilled manpower. Many of the tire builders have been inducted into the Army and Navy; while others have gone into other work. Women have been used for some of the lighter tire work, but since one of the acute needs is the manufacture of more bus and truck tires, the use of women workers is of little help here.

New Tire Plants May Be Built

It was announced late in August that the WPB had already granted some of the priorities for materials necessary to begin the expansion program, but one of the requirements of the program which was involved in considerable debate was the building of new plants and where they should be built. It seemed probable that as long as so much equipment and floor space continued to be used for the production of war products, some new plants would be required if essential civilian needs of tires for the next year or two were to be met. Since the Akron area is rated as critical from the manpower angle, there is some indication that new plants, if built, might be located where manpower would be more available. In any event new plant construction will probably be kept at a minimum in order not to build tire manufacturing facilities too much in excess of peacetime needs. It was reported that if the plans to keep the new plant construction to a minimum are carried out, the cost of the program would be much less than the estimated $95,000,000. According to a statement attributed to Rubber Director William Jeffers, the tire companies had expressed their intention of financing much of the expansion themselves rather than calling upon the RFC for the necessary funds.

Mr. Jeffers issued an invitation on August 26 to tire manufacturers and labor leaders of the industry to attend a joint management-labor meeting in Washington on August 31. The purpose of the meeting, as set forth in the identical telegrams requesting attendance, is to "immediately secure increased production from existing facilities and to minimize the expansion of facilities necessary to meet present and 1944 requirements."

Expansion Would Require More Cotton as Well as Rayon Cord

During the month a statement was made by the National Cotton Council calling upon the WPB to follow the recommendations of the report of the Senate Truman Committee and to defer any further expansion of rayon production facilities for tires until proper and complete tests show the advantages to the war effort of the use of rayon cord in tires. While many months will be required to complete the expansion of new rayon production units, cotton tire cord facilities, already established, already provided with trained labor, already adequate in capacity of production, will be pouring out tires on which forthcoming battles will be fought, it was stated, in arguing that cotton tire cords had already done a job in the war and should be allowed to continue to do so, until a more definite superiority for rayon cords was demonstrated.

The Rayon Organon and the *Rayon Textile Monthly* in their discussion of the controversy pointed out that although the large tire companies have large investments in cotton tire cord spinning facilities, they, the Rubber Director, and the Army have recommended and put through the conversion of regular rayon to high-tenacity rayon for tire cord and that this fact could only lead to the conclusion that the rayon cords were superior for the particular job to be done. The latter publication gives figures from 1937 to date on the growth of sales of high-tenacity yarn to show that the decision to equip the Armed Forces with rayon cord tires was based on several years' experience with this type of cord as well as exhaustive investigation and testimony of experts in the rubber tire and yarn industries.

It may be that both the cotton and rayon tire cord manufacturers will be provided with sufficient business to settle automatically the dispute, since in addition to increased facilities for actual tire making, the Rubber Director's program calls for the authorization for a stepping up of the output of high-tenacity rayon yarns and for cotton tire cord. The added output of high-tenacity yarn would be used in the production of military and heavy-duty tires, while the additional quantities of cotton tire cord would be devoted to the manufacture of passenger-car tires and tires for light-duty trucks.

EDITOR'S NOTE. On September 1 as a result of this meeting a "substantial reduction" in the proposed program was announced. Building new plants away from present sites was opposed by the CIO United Rubber Workers Union, who declared that considerably more than the scheduled 30,000,000 tires could be turned out in existing plants if additional machinery were installed.

Largest Synthetic Plant Opened

The world's largest synthetic rubber plant at Port Neches, Tex., which will produce 120,000 long tons of GR-S annually was opened on August 23 by The B. F. Goodrich Co., which will operate two of the four 30,000-ton units. At a dinner which marked the beginning of operations, George W. Vaught, vice president of the Goodrich company, stated that the total scheduled production of GR-S in the Lone Star State would be approximately as much synthetic rubber as all of Germany has turned out in a single year. Butadiene for the plant will be supplied by the adjacent government plant operated by the Neches Butane Products Co., and styrene will be obtained either from the Dow Chemical or the Monsanto Chemical operated plants in Texas. The other two units of the copolymer plant at Port Neches will be operated by the Firestone Tire & Rubber Co.

National War Labor Board Actions

The WLB early in August directed that a clause providing for the check-off of union dues be included in the contract between the Firestone company and the United Rubber Workers of America, CIO, covering the company's plant at Memphis, Tenn. This was to correct an error in transcribing the Board's action in the case as announced in the directive of July 15.

A 3¢-an-hour wage increase, retroactive to October 31, 1942, was granted to 2,000 production and maintenance workers at the Akron plant of the General Tire & Rubber Co. The board said its action was taken to correct maladjustments in wage rates under the "Little Steel" formula.

Cross-License Agreement (Buna Rubber)

On July 28, WPB Chairman Donald M. Nelson submitted to the Attorney General a standard form of agreement entitled "Cross-License Agreement (Buna Rubber)" which had been proposed by the Rubber Director and the Secretary of Commerce for execution between the Rubber Reserve Co. and private corporations undertaking to give assistance to the gov-

CALENDAR

Sept. 6-10.	A.C.S. Fall Meeting. Pittsburgh, Pa.
Sept. 16.	Buffalo Rubber Group. Hotel Westbrook, Buffalo, N. Y.
Sept. 23-24.	SAE. National Tractor Meeting. Schroeder Hotel, Milwaukee, Wis.
Sept. 30-Oct. 3.	SAE. National Aircraft Engineering and Production Meeting. Biltmore Hotel, Los Angeles, Calif.
Oct. 3-9.	Fire Prevention Week.
Oct. 5-7.	Rubber Division, A.C.S., Fall Meeting. Commodore Hotel, New York, N. Y.

ernment's synthetic rubber program. This agreement contained many interesting items such as the definitions of "Buna Rubber, Special Purpose Buna Rubber, Specialty Buna Compounds", and the "War Period." Under the definition of "Buna Rubber" it is stated that the resulting product shall contain not less than 50% by weight of combined hydrocarbon diolefins of the butadiene type. "Special Purpose Buna Rubber" is defined as Buna rubber mainly adapted for use other than as a general substitute for natural rubber in tires and other principal rubber products, and "Specialty Buna Compounds" have about the same classification. It is also stated that the Rubber Reserve Co. during the War Period may classify any new rubber as "Special Purpose Buna Rubber" or revise the classification on previous rubbers of this type after notice in writing to the parties involved. The "War Period" is stated as that period of time extending from December 9, 1941, through the first six months after the cessation of hostilities between the United States and Germany, Italy, and Japan. Also of interest is that statement of the right of the Rubber Reserve Co. to grant sublicenses which shall remain in force after the "War Period" with respect to lessees and original purchasers of government-owned Buna rubber plants, the construction of which was begun prior to the end of the "War Period."

WPB Announcements

Amendment 2, Rubber Order R-1, issued July 28, incorporates the following changes. Inventory certification on purchase orders of resellers of tires and tubes no longer is required on orders originating outside continental United States. Wheelbarrow and lawnmower tires have been removed from the list of prohibited products for both civilian and government orders, and compounding regulations for their manufacture have been added to List 24, Appendix II. The "molded wheels and casters" item on the list of permitted civilian order products (Schedule A) has been revised to indicate that both caster wheels and caster tires are included. Compounding regulations for this item also have been added to List 24, Appendix II.

All limitations on the use of rubber, either synthetic or natural, as a sealing medium for closures for glass containers have been eliminated from Conservation Order M-104, as amended August 9. This action was taken because WPB has been advised by the Office of the Rubber Director that adequate synthetic rubber is now available for making closures for glass containers for food and other items.

General Conservation Order M-317—Cotton Textile Distribution issued August 16, simplifies and makes more effective the priority pattern channeling distribution of a large part of the total annual production of woven cotton textiles into industrial and agricultural uses. Preference ratings higher than those previously used for procurement of woven cotton textiles for many essential products are assigned by this new order. Among the products affected are: coated abrasive products; safety equipment as defined and limited in Limitation Order L-114; rubber footwear as defined and limited in Rubber Order R-1, Schedule A, Code 66; rubber gloves as defined and limited in R-1, Schedule A, Code 71; rubber hose and tubing (including mine and shiphold ventilating tubing), rubber packing and gaskets, and other mechanical rubber products, as defined and limited in R-1, Schedule A, Code Nos. 62, 63, 64, and 73 respectively; tire retreading, recapping, and repairing materials thereof; certain nonselvage tape for industrial use; laminated phenolic products; and certain waterproofing products used for domestic or export shipments of military supplies. Concurrently with issuance of M-317, the following orders were revoked, as they are superseded by M-317: M-107—Cotton Textiles for Use in Bags; Schedule I of M-134—Industrial Cloth or Tape; Schedule III of M-134—Laminated Phenolic Products; and M-218—Cotton Textiles for Agricultural and Food Processing Uses.

Direction 11 to CMP Regulation 5, issued August 13, covers safety equipment purchased by employes, including such items as safety industrial rubber gloves and hoods, linemen's rubber gloves and sleeves, gas masks, respirators, goggles, and safety belts and harnesses.

The following products have been made subject to WPB restrictions: coated and bonded, including rubber bonded, abrasive products manufactured from aluminum oxide and silicon carbide abrasive grain (Conservation Order M-319-a, effective August 1); acetaldol, "ST-115", "Dehydrol-O", and "G. C.-78" (Allocation Order M-340, effective August 1); allyl chloride and allyl alcohol (Allocation Order M-342, effective September 1).

Allocation Order M-137, as Amended July 23, 1943, compels manufacturers who use under 50 gallons of benzene a month to certify to the supplier and the WPB that they are not using more than that amount.

Allocation Order M-150 — Petroleum Solvents—as amended July 28, places high-flash naphtha under allocation control. The amendment also increases the small-order exemption for petroleum solvents, except for high-flash naphtha, from 60 to 550 gallons.

Allocation Order M-150 as Amended August 4, 1943—Aromatic Petroleum Solvents—requires a consumer to specify the gallons of such solvents requested for certain uses including natural and synthetic rubber solution.

Allocation Order M-243 was amended August 7 to cover acetic acid and acetaldehyde as well as acetic anhydride.

Conservation Order M-65-a as Amended July 27, 1943, prohibits the use of cadmium in pigments except for certain specified uses including dental rubber and rubber sea buoys.

Conservation Order M-56, restricting the use of natural resins and issued early last year to conserve the use of dammars, batus, copals, and other natural resins, but not including shellac or pine resin, was revoked July 28 to encourage the importation of Belgian Congo copal.

General Preference Order E-5-a as Amended July 26, 1943—Gages and Precision Measuring Hand Tools—covers purchases by and deliveries to employes.

General Preference Order No. M-34—Toluene (Toluol)—has become Allocation Order M-34. As amended July 23, it permits a laboratory to accept delivery of five gallons or less of toluene in the aggregate from all suppliers in any month and also allows government owned plants to use, accept delivery, or deliver to another government owned explosives plant toluene for the production of explosives, without specific authorization.

Warplane tires can live longer and stand up better under heavier going now because of the ingenuity of one American workman. Eugene A. Roberts, 41, employe of the Firestone Tire & Rubber Co., Akron, O., has been awarded the Citation for Production Ideas, the highest honor bestowed by the War Production Drive Labor Management Committee's Board of Individual Awards. He developed a "channel tread" plane tire which not only makes possible safe landing of military planes at high speed on rough terrain, but also saves vast quantities of rubber and quantities of other critical material by simplifying the wheels on which the new tire is mounted. Planes equipped with such tires can be brought down on any reasonably level ground with little danger of a crash. Firestone's patent rights and complete specifications for making the "channel tread" tire have been made available without charge to the entire rubber industry.

Legal Rulings

Suspension Order S-370, prohibits, under certain conditions, from July 31 to October 31, 1943, the Atlantic Mfg. Co., Wilmington, Del., from using any crude or reclaimed rubber. This punishment was meted out by the WPB because the company was found guilty of unauthorized consumption of crude and reclaimed rubber in certain products in violation of Supplementary Order M-15-b and of unauthorized consumption of rubber cement, contrary to Supplementary Order M-15-f.

Samuel S. and Joseph L. Goodman, copartners doing business under the names of Old Town Rubber Co. and Moose River Shoe Co., all of Old Town, Me., having been found guilty of use of reclaimed rubber for soles and heels in violation of Supplementary Orders M-15-b and M-15-b-1, effective July 10, discontinued the compounding, milling, vulcanizing, and molding of rubber into soles and heels and the processing or assembling of heels and soles except for such work as is performed under toll agreements for other companies or until prior written authorization has been received from the Office of the Rubber Director. In such event samples of finished products must be submitted for tests once a week for 15 weeks to a laboratory acceptable to the regional director of the WPB Boston regional office, who shall also receive copies of the laboratory reports.

New and Revised Ceilings on Rubber Goods

New bicycle tires and tubes are given dollars-and-cents ceilings for brands and sizes in MPR 435, which covers their sales at all levels from the manufacturer to the retailer, except for sales to the United States or its agencies and sales in which the price is that of a whole bicycle. Maximum prices for sales to consumers are no higher than the recent level of ceiling prices and affect tire replacements for 10 to 12 million bicycles estimated to be in use in the United States. Nearly 80% of the tires made in 1942 were for replacement sales. The specific retail prices correct an inflationary tendency evident in many wholesale and retail prices for tires in March, 1942, and reflected in some sellers' maximum prices when frozen at the March, 1942, level by the General Maximum Price Regulation. Besides establishing specific ceilings for all at a fair and equitable level that does not increase the cost of living, the new ceilings for wholesalers and retailers adjust margins over manufacturers' prices which in many cases had become out of line in March, 1942. Ceilings for manufacturers are increased slightly over the level for March 1942, to provide for increased production costs due to substitutions in raw materials. The increase is absorbed at the wholesale and retail levels and therefore does not increase the price to the consumer. The absorption does not, however, reduce wholesalers' and retailers' margins below their normal levels of October, 1941.

Amendments to three other regulations were made necessary by MPR 435, to become effective on the same date. Amendment 11 to MPR 220—Certain Rubber Commodities—removes bicycle tires and tubes from that regulation, which formerly controlled manufacturers' prices. Amendment 1 to MPR 403—Certain Rubber Commodities Purchased for Governmental Use—provides that sales to the War and Navy Departments and original equipment sales on war orders of bicycle tires and tubes be covered by MPR 403. Amendment No. 2 to Supplementary Regulation 14 provides that maximum prices for used bicycle tires, tubes, and rim strips established under GMPR shall in no case exceed the maximum prices for such items when new.

Wholesale and retail ceilings for bicycle tires and tubes formerly established under GMPR are automatically removed from its coverage by issuance of MPR 435.

Besides covering bicycle tires and tubes the new regulation covers rim strips, given a retail ceiling price of 10¢, and the service of mounting tires on bicycle wheels. Except in exceptional cases, for which ceilings must be established according to MPR 165—Services—the ceiling price for mounting a tire on a front wheel is 25¢, and for mounting one on a rear wheel is 50¢.

Chosen as the base-size tire in relation to which prices for other sizes are established is size 26 by 2.125. About 75% of the tires sold for replacement use are of this size.

Manufacturers' maximum prices to brand owners are lower than the ceilings to jobbers by the amount of the saving in commercial expenses on that type of sale.

Maximum prices for sales by manufacturers to bicycle manufacturers for the original equipment of bicycles are fixed at the March, 1942, level. OPA determined that bicycle manufacturers are not in a position to absorb any increase in the price of bicycle tires; therefore it is necessary to hold prices to them at the March, 1942, level to avoid an increase in the cost of living to bicycle users.

Wholesale and retail specific prices for brands and sizes were determined by applying margin percentages that prevailed generally in October, 1941, to the cost of the tires to the wholesalers and retailers.

Brands are listed under owners' names in the appendix of retail prices. While each brand has a uniform price for each seller of the same class throughout the regulation, the prices vary for different brands of the same size. Established industry practice is followed in this respect.

Effective dates for MPR 435 follow: District of Columbia and the 48 states, July 29; territories and possessions of the United States, September 6.

As hospital-grade hot water bottles and combination syringes of synthetic rubber are coming on the retail market for the first time, retail ceiling prices are given them in line with prewar prices for the same grade when made of crude rubber, in Amendment 8 to MPR 301—Retail and Wholesale Prices for Rubber Drug Sundries—and Amendment 10 to MPR 300—Manufacturers' Maximum Prices for Rubber Drug Sundries, both effective August 19. Manufacturers' and wholesalers' ceilings for sales to hospitals were in the regulations amended and are the same whether the articles are of crude or synthetic (Buna-S) rubber. The same principle is applied in establishing the retail prices.

Restrictions on crude rubber prevented its use in the hospital grade of hot water bottles and combination syringes for sale to individual consumers although it could be used for goods sold to hospitals. But current availability of synthetic rubber makes the grade once more available to individual buyers.

While no price increase is represented by the ceilings set for the hospital grade on sales in the retail market, because they are at the same level that existed before the war for sales of the same grade when of crude rubber, these prices have always been above those for hot water bottles and combination syringes of lower grades. (The hospital grade is made to more stringent specifications and is more durable and serviceable than those grades not made especially for use in hospitals.)

Also reduced were manufacturers', wholesalers', and retailers' maximum prices of virtually all rubber drug sundries in which synthetic rubber is used in order to reflect reductions made before August 1 in the price of synthetic rubber. The only exception is for neoprene bulbs, bulb goods, and catheters. OPA explained that the current maximum prices and differentials for these specific neoprene rubber goods are effective only to September 30, 1943. There has not been sufficient industry experience with their production to enable OPA to establish permanent maximum prices and differentials for them, and it is not considered reasonable to require their manufacturers to reprint their price lists in August and again in September.

On Sales to the Government

A simplified method for pricing some sea rescue balloons, parachute parts and equipment, life rafts, airplane deicers and other rubber products sold to the government appears in Amendment 2 to MPR 403, effective July 30, which applies to products that include material the manufacturer has bought from the war procurement agency to which the product is sold, and facilitates operation under a form of contract that has come into use recently to expedite war production. Under such contracts a war procurement agency, such as the War or Navy Department, may provide that the manufacturer buy from the agency fabrics to be used in making commodities sold to it. Further to expedite the proceeding, the OPA provides that the manufacturer shall use the net price he paid the war procurement agency for the material in computing his maximum price for the commodity in which it is used.

Other changes in the amendment broaden coverage of the regulation, and further simplify pricing of products, almost all of which are military.

Products added specifically to coverage of the regulation are ammunition case linings, bag liners, eyeshields for gun sights, goggles, sea rescue balloons, waterproof sails and maps, and industrial life suits. Articles previously covered by the regulation include flying suits, gas and oxygen mask parts, jungle hammocks, ponchos, landing boats, bullet sealing hose, and pontoons.

Reduced prices of synthetic rubber have been reflected in maximum prices provided in the regulation, and Amendment 2 clarifies some of the requirements for computing the changed ceilings. Manufacturers are given credit for voluntary reduction in their prices to reflect decreased prices of synthetic rubber before April 30, when they made such reductions. Manufacturers who do not compound the synthetic or substitute rubber or balata contained in the products they price are told in detail how to determine the difference in their price to reflect the lowered cost of the material.

One provision gives manufacturers a method for computing a single differential so that several commodities differing in size, style, or compounds may be sold at the same price if that has been the manufacturer's practice. Another enables sellers to calculate maximum prices to the nearest fraction of a cent they customarily used in April, 1943, in pricing similar commodities, thus clearing up any possible confusion on that point.

So that the reduction in the price of neoprene from 45 to 27½¢ a pound be

reflected in the maximum prices paid by the government for a variety of commodities in which the synthetic rubber is used. Amendment 3 to MPR 403 was issued, effective August 14, providing that the prices for synthetic and substitute rubber and balata in effect August 1, 1943, must be used in determining the ceilings of commodities containing those materials which are covered by the regulation. The amendment provides that repair kits for a list of commodities covered by MPR 403 be covered also. The kits are for such things as flying and diving suits, life rafts, and inflatable boats.

MPR 415—Certain Federal Government Purchases of New Rubber Tires and Tubes—as amended (No. 1, effective August 2), indicates the regulation applies in the District of Columbia, the 48 states, and the Territory of Hawaii, but not in the other territories and possessions of the United States.

Specific ceilings for sales of new rubber tires and tubes to the Federal government when the tires and tubes are wholly or partly of GR-S, will not go into effect until November 1 under amendments 2 to MPR 415 and 5 to MPR 119—Original Equipment Tires and Tubes—both effective August 1. Earlier OPA had exempted the synthetic rubber tires and tubes from provisions of the two price regulations until August 1, because their production was in an experimental stage and data were not sufficient to enable establishing satisfactory ceilings; but August 1 proved too early to secure enough data to bring such sales under specific price action. The fact that government agencies are the sole buyers of the tires and tubes and that they are cooperating with OPA in maintaining prices at a fair level, is regarded as sufficient safeguard for the present against the prices becoming inflationary.

Tire Rationing and Ceilings Revisions

RO 1A—Tires, Tubes, Recapping, and Camelback—has undergone further revision. Amendment 42, effective July 29, provides for OPA Form R-2, Revised, a revised simplified tire rationing certificate to replace three different forms distributed by local War Price and Rationing Boards for securing tires, tubes, and truck tire recapping by consumers, allotments of dealers' initial stocks, purchase of emergency reserves of tires and tubes by operators of long-haul vehicles, and allotments of camelback to tire recappers.

No. 43, also effective July 29, presents a plan whereby applications for tires, tubes, and recapping services for commercial vehicles will be passed upon by tire experts in areas with sufficient concentrations of such vehicles to warrant setting up the new procedure. Purpose of this policy, actuated by the present truck tire shortage, is to make certain no replacements are issued for tires and tubes which, in the opinion of an experienced tire man, can be made to give additional mileage. The new procedure, moreover, involves changes in the rules governing applications for tires and tubes for immediate use as well as applications for "emergency reserves."

Amendment 44, effective August 6, incorporates three changes. The first sanctions recapping of farm service tires with truck-type camelback, following recent WPB action authorizing such use of the rather scarce recapping material, rationing certificates calling for the service are required. Then, a move to facilitate local distribution of tires increases from 50 to 75 the number of sectional warehouses a manufacturer may have. The third change, to protect the normal position of the retail merchant in the tire trade, provides that manufacturers of tires, tubes, and camelback can sell or lease tires or tubes to consumers only if the consumer has bought or leased tires or tubes from a manufacturer between December 31, 1940, and August 6; wholesalers can sell or lease only to consumers who bought or leased from manufacturers or wholesalers in the same period.

The next amendment, effective August 23, treats of procedure for importing new tires and new tubes (one drives less than 1,000 miles) into this country; exclusive jurisdiction over such imports has been given the OPA by WPB in Directive R-1. To get such imports one must first apply to the War Price Rationing Board for a certificate describing the tires and tubes to be imported, which is then presented to the United States Customs officials. A person unable to secure authorizations for importing tires and tubes may dispose of this merchandise to any U. S. dealer or manufacturer of tires and tubes upon written authorization from the OPA district office; to the Defense Supplies Corp.; or to a person located outside the continental United States. Certain exemptions also are covered in Amendment 45: A person who makes a sworn statement that his vehicle has been outside continental United States continuously since December 1, 1942, or since the date of its purchase may import the tires and tubes mounted on the vehicle. A person may import his own tires recapped outside the continental United States. Diplomatic or commercial representatives of a foreign government are exempt under certain conditions. Tires or new tubes may be imported from Canada if they were manufactured in continental United States, Canada, or the British Isles.

Under Amendment 46, effective August 18: (1) dealers with recappable truck tire carcasses may get truck-type camelback to recap these tires by applying to their OPA district office; and (2) manufacturers may sell used truck tires to dealers without rationing certificates under authorization of the OPA district office. Both these provisions will make more truck tires available to consumers with access to replenishing supplies of camelback; dealers will be able to recap used tires in their possession without depleting their present stock of camelback. The dealer's application to the OPA district office must contain the sizes and serial numbers of tires to be recapped. The approval of an OPA tire examiner certifying that the tires need recapping must also be obtained. The second provision eliminating the need of certificates will expedite considerably the flow of available used truck tires to the dealer level.

These truck tires, inventories of which have been low, now include 200,000 used tires acquired by the Defense Supplies Corp. from the U. S. Army. While unfit for heavy military service, the tires can be made serviceable for civilian use. These used truck tires have already been removed from DSC warehouses to tire manufacturers, who may now sell them to dealers. However, as in the past, dealers can sell these tires to consumers only on the basis of a ration certificate.

The amendment also: (1) requires a tire inspector, when certifying the need of a tire replacement for a passenger automobile, to indicate also the condition of all tires mounted on that vehicle, since under present regulations ration boards may not grant a certificate for any tire for a vehicle which already has four tires in serviceable condition and a fifth good enough as an emergency spare; (2) authorizes dealers, or manufacturers to sell tires or tubes to a manufacturer or rebuilder, or dealer in vehicles, in exchange for tires or tubes mounted on a new or rebuilt vehicle as part of its original equipment upon written authorization of the district office instead of the OPA regional offices.

RO 1 C, effective September 1, pertains to mileage rationing: tire regulations for the Virgin Islands.

In accordance with requests from the rubber tire recapping industry, Amendment 5 to RPS 66 as Amended—Retreaded and Recapped Rubber Tires and the Retreading and Recapping of Rubber Tires—effective August 23, gives dollars-and-cents ceiling prices for recapping truck and bus tires with ground grip treads. They apply to a number of tire sizes besides those previously so priced. Specific ceilings had been provided earlier for ground grip treads for a number of truck and bus tire sizes reported as being recapped most frequently. Those newly priced had been assigned the same ceilings as those for conventional truck and bus treads for the same sizes. Ground grip tread ceiling prices established earlier for recapping and retreading other sizes of tire were at levels slightly higher than those for the conventional tread, so are the ceilings given in Amendment 5.

The amendment also restores to the tire recapping and retreading price schedule a table of ceiling prices for recapping tires for tractors with rice and cane special service and farm tractor types of tread of Grade C camelback. This table, removed from the schedule June 7 when recapping such tires with Grade C camelback was discontinued, is replaced to provide ceilings for any Grade C camelback that may be available. The table of ceiling prices for such treads made of Grade F camelback is retained in the schedule, and now applies to any grade other than C. (The WPB does not permit Grade A to be used for the farm tractor and rice and cane special service types of tread.)

Another change provides that specifications issued by the WPB for camelback of grades A, C, and F are adopted by the OPA as its specifications for those grades

of camelback. This gives the schedule enough flexibility so that recapping with any camelback (such as that made of crude, reclaim, or synthetic or substitute rubber) which the WPB brings within scope of the grades is covered by ceiling prices in the schedule.

Specific ceiling prices are given for retreading and recapping 8-ply truck and bus tires of size 13.00—24 (12.75—24) with road grader treads. This fills an unintended gap in the schedule.

Tire and tube quotas for August follow: Grade I, new passenger-car tires, 829,000, against 1,061,261 for July; Grade III, used and recapped tires, 644,000, against 414,931; inner tubes, for passenger cars, 757,160, against 736,500, for trucks, 356,639, against 332,056; truck tires, 417,265, against 414,977; farm tractor and implement tires, 73,600, unchanged from July.

Amendment 4, MPR 131—Camelback—effective August 2, extends manufacturers' ceiling prices for camelback to grades of synthetic rubber, which are the same as ceilings for corresponding grades (A, C, and F) of camelback made of crude or reclaimed rubber.

Changes in Footwear Rationing Regulations

MPR 200—Rubber Heels, Rubber Heels Attached, and Attaching of Rubber Heels—underwent further revision last month. Amendment 10, effective August 12, gives ceilings for corded rubber men's half heels of all sizes, which have come on the market only recently, for sales to wholesalers, repairmen, and consumers. Generally the corded heels are made from reclaim rubber in which cotton cords are placed to increase wear resistance. These half heels are now priced at the same ceilings as those for boy's corded whole heels of the same quality, following industry practice. The maximum price for sales to wholesalers is $1.58 per dozen pairs, to shoe repairmen, $2.10 per dozen pairs, and to consumers 55¢ a pair attached to shoes. Another change in the tenth amendment, following practice of the trade, permits a wholesaler who sells to another wholesaler to add to his maximum price for heels the same proportion of transportation costs that he added to his selling price in March, 1942.

The next amendment, effective August 5, in compliance with the anti-grade labeling provision written into the Emergency Price Control Act of 1942 by the Taft amendment to the Commodity Credit Corp. Act, removes the requirement of grade labeling for rubber heels from MPR 200. Manufacturers, however, are not prohibited from using the symbols to which grade specifications were tied in the regulation, if their heels meet the corresponding specifications. Amendment 11 preserves the structure under which Victory model rubber heels have been priced according to abrasion and tensile strength tests. These heels are of the same type made since August 31, 1942, the grades of which correspond to those used by the industry before the regulation was issued. Thus V-1 heels correspond to "super" heels; V-2 heels to "standard" heels; V-3, to "competitive" heels; and V-4, to "special competitive" heels. The V-4 specifications were established by the WPB. The other V-grades were established by OPA in relation to the V-4 heels on the basis of the grade differences customarily recognized in the industry, and named in the preceding paragraph.

Manufacturers who do not choose to continue marking their heels with the V symbols must sell the heels at prices set for them according to brand names, which prices likewise are established according to the physical tests the heels can meet. If these manufacturers find that the heels bearing brand names, but no V symbol cannot meet the abrasion and tensile strength tests for the grade in which the brand name is classified, they must price their heels according to the physical tests they can meet. Also, they must report this fact to the OPA. The physical tests are to be applied to determine price classifications only for manufacturers. As wholesalers and retailers have no way to make abrasion and tensile strength tests, they will continue to sell the heels not marked with V symbols according to the maximum prices set for each brand name. However, any heels that the wholesalers or retailers have bearing the V symbols must be sold at or below the ceiling prices for those grades.

But because the OPA found it impossible to prepare and distribute by August 5, posters on ceiling prices for rubber heels and the attaching of rubber heels, it, by Amendment 12 to MPR 200, effective August 20, allows shoe repairmen until October 5 before they are required to exhibit the posters in their places of business. Amendment 11 had required that the posters be exhibited by August 5.

Amendment 7 to MPR 229—Retail and Wholesale Prices for Victory Line Waterproof Rubber Footwear—effective August 10, establishes maximum wholesale and retail prices for three types of men's black rubber no-lace mine pacs, production of which was recently authorized by the WPB to meet needs of miners in Montana copper mines. Differences in the maximum retail prices given grow out of the varying discounts granted by wholesalers and manufacturers to different classes of retailers. Wholesale ceilings are set at customary margins above prices charged by manufacturers.

Two provisions also are added to the regulation by the amendment: a seller may make no charge for extension of credit except such as those made in the base period February 11 to September 29, 1941; and, the seller may add to his maximum prices no charge for services rendered the purchaser unless he made such charges in the base period, and such charges shall not exceed similar charges made during that time. The amendment, furthermore, revokes the provision requiring wholesalers and retailers to file their ceilings with local War Price & Rationing Boards, as this requirement no longer serves a useful purpose.

Amendment 3 to RO 6A—Men's Rubber Boots and Rubber Work Shoes—effective August 26, extends the availability of below-the-knee lightweight rubber boots (Type 4) to persons whose occupations are not classed "essential", increases opportunity for some employers to furnish employes with rubber footwear, and also releases from rationing certain kinds of rubber boots useful in farming and similar work, but no longer being made for general use, including all olive-drab, clay, or khaki colored rubber boots, all over-the-shoe rubber boots, and all lightweight ankle-fitting rubber boots which depend on stretch at the ankle for fitting. Each dealer, moreover, having in stock any rubber footwear released from rationing must attach to his inventory form a statement of the number of pairs of each type released and send a copy of the statement to his OPA district office before selling any such rubber footwear ration-free. Increased allocation of rubber by the WPB permitted OPA to make the rationing changes.

Amendment 32 to RO 17—Shoes—effective August 18, rules that non-leather shoes with soles containing a small percentage of reclaimed rubber or made from low-grade friction scrap may be sold ration-free. This ruling covers only footwear shipped from the factory after August 15, 1943, but does not affect shoes in dealers' stocks before that time. The Office of the Rubber Director is making a limited quantity of reclaimed rubber available for non-rationed footwear. Non-leather shoes (which may, however, use leather as top lifts) may be sold ration-free if the soles are made principally of wood, rope, fabric, or fiber, in which reclaimed rubber is used in an amount not exceeding 15% by volume. Non-leather shoes with soles wholly of low-grade friction scrap (of a quality not being purchased by the Rubber Reserve Co. at the time the sole is made) and bound together by compression and vulcanization may also be sold ration-free. Despite the necessarily technical nature of the definition contained in the amendment, retailers will be able to identify any such non-rationed footwear because the manufacturer is required to invoice rationed and non-rationed shoes separately. The manufacturer will be able to classify such shoes easily because he can obtain from his supplier of soles technical information regarding their rubber content.

Amendment 32 also specifically states that footwear for athletic, sport, or gymnasium use is not included in the definition of non-rationed house slippers. This clarifying action was necessary because some dealers have been selling bowling shoes, gymnasium shoes, and other similar types of footwear as non-rationed on the ground that they are constructed solely for indoor use or house wear. In regard to house slippers, OPA further pointed out that the use of a sole containing not more than 15% reclaimed rubber by volume will not place such slippers on the rationed list. Previously no rubber could be used in the sole of a non-rationed house slipper made after August 31.

Rulings on Other Rubber Goods

Amendment 4, RPS 82—Wire, Cable, and Cable Accessories—effective August 4, provides for individual adjustments of ceilings for producers and sellers of these products similar to adjustment provisions recently made available to manufacturers of essential machinery. The new adjustment provisions are substantially the same as set forth in Amendment 78 to MPR 136—Machines and Parts and Machinery Services—effective April 10.

Amendment 8, RPS 87 as Amended—Scrap Rubber—effective August 13, decrees that maximum prices for hard rubber scrap and for bicycle inner tubes sold for the manufacture of rubber bands, must be figured according to GMPR. Persons dealing in scrap rubber during March, 1942, shall be considered competitive sellers of the same class as Rubber Reserve Co.

Amendment 13 to MPR 149—Mechanical Rubber Goods—effective August 9, reflecting the reduction in the price of neoprene from 45 to 27½¢ a pound, lowers ceilings of rubber products containing the synthetic. The changes affect hose, belting, packing, and similar commodities and molded, extruded and lathe-cut rubber goods bought chiefly by industrial consumers and for the government. These products for the most part are not sold to individual consumers.

The amendment also establishes consumers' maximum prices for two kinds of neoprene hose recently put on the market: gasoline hose of the service station pump type, and molded-braided welding hose. The gasoline hose is priced at 41¢ a foot for ¾-inch hose, and 52¢ a foot for one-inch hose. The welding hose ceilings range from $13.18 per 100 feet for 3/16-inch one-braid hose, to $20.22 per 100 feet for ⅜-inch two-braid hose.

In telling how prices of various goods are to be reduced, the amendment provides a method whereby manufacturers who maintained differentials in prices to different classes of buyers on either of the base dates in the regulation may continue to use such differentials. (October 1, 1941, is the base date for such products as belting, hose and packing; January 5, 1942, for most molded, extruded and lathe-cut goods.)

Amendment 13 also gives a formula which manufacturers may use in determining maximum prices so as to continue selling several sizes, styles or compounds of a synthetic rubber article at one price if they have been accustomed to do so.

A provision in relation to maximum prices for hose made of neoprene or "Thiokol" is amended so that the 10% discount which must be deducted when the hose is sold in standard package lots need be deducted only if the manufacturer gave that discount on October 1, 1941. This change is made because the discount was not given for certain types of hose on October 1, 1941.

Amendment 12 to MPR 220, effective August 12, reflects the reduced price of neoprene in lowered ceilings for rubber fabrics, apparel, and other commodities in which the synthetic is used. By setting August 1, 1943, prices of synthetic or substitute rubber or balata as those to be used in computing maximum prices, the amendment includes all recent reductions in the price of neoprene. The amendment contains three other changes: a method that manufacturers who do not compound the synthetic or other substitute rubber contained in their products shall use to determine the cut required in the maximum prices of the commodities; a method by which the manufacturer can calculate the differential to use to continue his practice of selling various sizes, styles, or compounds of a synthetic rubber article at the same price; and a method whereby sellers can figure their ceilings to the nearest fraction of a cent that they customarily used in pricing similar commodities in March, 1942.

Order 596 under 1499.3 (b) of GMPR approves the maximum price, effective August 7, for sales of a new baseball center made by A. G. Spalding & Bros., Inc., Chicopee, Mass.

Additional OPA Regulations

Amendment 2 to Rev. MPR 180—Color Pigments—effective July 30, takes into consideration certain transportation costs that may be added to ceiling prices.

Amendment 7 to MPR 37—Butyl Alcohol and Esters Thereof—effective July 29, presents a sliding scale of maximum prices for dibutyl phthalate.

Amendment 8 to MPR 37, issued August 20, but effective July 1, 1943, allows producers to seek OPA approval for permission to use slight variations from established methods of computing their average grain costs in determining their ceilings for butyl alcohol. Amendment 6, effective July 1, provided two methods of figuring average grain costs to be used in the making of price adjustments in line with grain prices.

Producers' sales of pine tar and pine tar oil were brought under a separate price regulation, MPR 446, effective August 19. The new regulation does not change the recent level of prices, which are those previously established by GMPR. But instead of each individual producer's highest March, 1942, prices, the new measure sets specific uniform ceilings for the entire industry. Not covered are sales to the Defense Supplies Corp. by specified high cost producers, named in Order No. 30 under GMPR.

Since dealers' costs generally will not be affected by the action, sales by dealers remain under GMPR. Sales at retail are not customarily made since the users primarily are industrial users. Retail sales when made, are under GMPR.

MPR 452 covers manufacturers' maximum prices for automotive parts; while MPR 453 relates to wholesalers' and retailers' ceilings for automotive parts. Both regulations are effective September 2.

National Bureau of Standards, Washington, D. C., is assisting the Brazilian Government in the installation of a modern rubber laboratory at the Instituto Agrinomico do Norte at Belem. Word has been received that nearly all the machinery, supplies, and equipment purchased for the laboratory in the United States, have arrived safely and are in process of installation. Even in advance of the completion of the laboratory, Norman Bekkedahl, of the Bureau's rubber section, who is in charge of the work, and his assistant, Fred L. Downs, have been able to start investigations on methods of tapping and the preparation of crude rubber. The location of the new laboratory at the mouth of the Amazon River gives it convenient access to a wide variety of rubber-producing trees and plants; moreover, this strategic location should make it possible for the laboratory staff to aid in developing the entire Brazilian rubber industry. This is the only rubber laboratory in the tropics serving the United Nations.

The War Department, Washington, D. C., recently announced that beginning immediately all Army rubber footwear procured by the Quartermaster Corps will be manufactured with 30% less crude rubber than heretofore used; Buna S will be substituted. The saving of crude rubber resulting from this change in manufacturing overshoes, shoe pacs, jungle boots, waders, and other types of rubber footwear was expected to exceed 70,000 pounds during July. Even greater savings are anticipated in the coming months when it is planned to lower still more the crude rubber content of Army rubber footwear by substituting Buna S. The crude rubber content will be reduced gradually, according to present plans, until it is eliminated entirely from most types of rubber footwear.

American Trucking Associations, Inc., 1424—16th St., N.W., Washington, D. C., faced with a serious shortage of truck tires due to intensified military and lend-lease demands, last month launched a campaign to intensify tire conservation efforts. This campaign tied in with a special drive made by Rubber Director Wm. M. Jeffers in which he called on the governors of all states to back up ODT and OPA tire conservation and inspection procedures. An important part of the ATA campaign was the distribution of simplified charts which show sound loading practice.

Office of Defense Transportation, Washington, D. C., on August 27 announced that eligible truck operators with tire rationing certificates who are unable to locate within their county the proper tires may apply to their nearest ODT Motor Transport District Office for assistance. This information will in turn be transmitted daily to the Office of the Rubber Director, who will endeavor to arrange for the proper redistribution of tires so that all the certificates can be honored as quickly as possible after issuance. This procedure was decided upon, the ODT stated, after some truck operators reported they were unable to obtain critically needed tires and as a result had to keep vehicles out of operation, often thus delaying important war freight.

EASTERN AND SOUTHERN

War Uses of du Pont Fabrics

The "Fabrikoid" Division of the E. I. du Pont de Nemours & Co., Inc., is engaged today primarily in coating and impregnating fabrics with pyroxylin, rubber, synthetic rubber, and synthetic resins for numerous war uses. An exhibition of many of the new products being manufactured and an explanation of their uses were given recently by C. A. Alt, of the "Fabrikoid" Development Division at the New York offices of this division, 350 Fifth Ave., New York, N. Y.

One of the first and probably best known developments has been the use of polyvinyl acetal resin to furnish millions of fighting men with weatherproof clothing, particularly raincoats. With this synthetic resin called Butacite by the du Pont company, it has been possible to save one-half pound of rubber per coat and cut down the overall weight of the coat by about two pounds since lighter weight fabrics could be used. In addition to good flexibility over a range of temperatures from the tropical to the arctic, this resin coated fabric resists the effects of gasoline and oil and withstands sunlight better than rubber.

Other interesting developments described were mountain-tent sections for troops in Alaska and a new kind of sleeping bag, both coated with synthetic resins strong enough to resist terrific winds and in the case of the sleeping bag to keep out cold and dampness. For jungle duty is a comfortable hammock complete with a resin-coated fabric canopy which is light in weight and proof against rain, dampness, and mildew. The outer covering of the big sheeplined coats for use by the Navy and Merchant Marine in the winter gales of the North Atlantic has an outer covering of special drill fabric coated with synthetic resin which does not stiffen in sub-zero weather the way ordinary pyroxylin or oilcoated fabrics have in the past. A field shelter used to repair and maintain airplane motors in bad weather is also representative of wartime resin-coated fabric applications. Many other items such as all-purpose, waterproof ponchos for the Marines, life-raft utility fabric used as a roof over drifting rafts of resin coated nylon fabric, sealed kits holding first-aid equipment, and kapok-filled life-preserver jackets made of a lightweight fabric coated on both sides with synthetic resin compositions were also described.

A significant use of "Fairprene", neoprene coated fabric, is for non-static type of hospital sheeting which safeguards against loss of life arising from ether explosions on the operating table. This sheeting was developed at the request of the Navy. Another important contribution is the use of "Fairprene" in self-sealing fuel cells for combat aircraft.

General Electric Co., Schenectady, N. Y., has appointed Ralph J. Cordiner assistant to President Gerard Swope. Mr. Gordiner, who resigned in June as vice chairman of the War Production Board, was formerly president of Schick, Inc., Stamford, Conn., prior to which he was manager of the GE appliance and merchandise department. His headquarters are at 570 Lexington Ave., New York, N. Y.

American Institute of Chemists, Inc., recently moved to the Lincoln Bldg., 60 E. 42nd St., New York, N. Y.

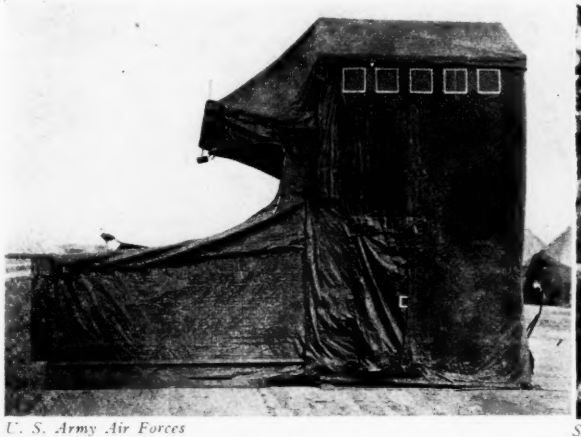
McCreary Tire & Rubber Co., Indiana, Pa., in a bulletin to its customers warns fleet operators not to expect service from synthetic tires comparable to that from tires of natural rubber. The bulletin also contains instructions on load per tire, speed limit, correct air pressure, etc. Current industry test work, according to the company, indicates that small truck tires will perform about 65% as well as prewar tires under present operating conditions, medium-size truck tires, 55%, and large truck tires, 25-55%.

Intercontinental Rubber Co., 745 Fifth Ave., New York, N. Y., in its report to stockholders for the first half of 1943 revealed that the company's guayule production in Mexico for the period totaled 7,001,600 pounds, contrasted with 6,359,500 pounds in the first six months last year. The company initiated an extensive guayule cultivation program, and the demonstration work of the past year has been very encouraging. The concern hopes to harvest cultivated shrub in time to replace the diminishing wild shrub supply and thus assure continuity of operations. Much research has been done to improve the quality of guayule rubber, and a process of deresination has been developed. Equipment for a small deresination plant was sent last month to Mexico, and Intercontinental Rubber expects to introduce the new product to the trade before the year-end. President C. L. Baker further stated that the counsel and guidance of a group of agricultural scientists experimenting in Mexico for the United States Government has also been available.

Carrier Corp., Syracuse, N. Y., last month announced that C. Robert Powers had joined its manufacturing division as production control manager. Mr. Powers has had wide and varied experience in the field of production management. At one time he was production manager for Browne & Sharpe Mfg. Co., Providence, R. I., and a guest lecturer at Rhode Island State University, and lately he worked with the War Production Board on management production control in New England.

The Association of National Advertisers, Inc., 285 Madison Ave., New York, N. Y., among its new members includes the following: Hewitt Rubber Corp., Buffalo, N. Y.; Minnesota Mining & Mfg. Co., St. Paul, Minn.; Phillips Petroleum Co., Bartlesville, Okla.; Seiberling Rubber Co., Akron, O.; and Taylor Instrument Cos., Rochester, N. Y.

Edelco Rubber Co. has moved to larger quarters to the sixth floor of 362 Fifth Ave., New York, N. Y.



U. S. Army Air Forces

Du Pont Resin-Coated Fabric Maintenance Field Shelter for Aircraft

Signal Corps Photo

"Butacite" Resin-Coated Fabric Sleeping Bag

U. S. Rubber Activities

United States Rubber Co., 1230 Sixth Ave., New York, N. Y., will increase by 50% its capacity for the production of asbestos fabrics used principally in war products, according to President Herbert E. Smith. This increase will result from expansion of the asbestos facilities of the Stark Mills, operated by the company's textile division in Hogansville, Ga. The material is used in making fire-fighting suits for the Armed Forces, air ducts for both the heating and deicing of bombers and fighter planes, insulating tape for naval cable and electrical apparatus, and other products vital to the war effort.

"Our company has developed a new method of spinning asbestos fibers into fine yarns," Mr. Smith said. "Fabrics made from these yarns, known as Asbeston, are extremely lightweight. For example, fire-fighting suits made of it weigh only one-half as much as suits of conventional asbestos fabrics. These suits, which are standard equipment aboard aircraft carriers, and at Army air bases, facilitate the fighting of fires and rescues from fire. Likewise, the lightness of the material makes it ideal for use in air ducts and other equipment on planes, and it replaces critical metals."

Many new and unusual applications for this new type of asbestos textile are anticipated by the company in the postwar market.

A second unit of the Buna S copolymerization plant of U. S. Rubber at Naugatuck, Conn., last month was turned over ready for operation by the Blaw-Knox Co., Pittsburgh, Pa. This will bring production of Buna S rubber at Naugatuck up to a capacity of 30,000 long tons a year. The unit just completed more than doubles the original synthetic rubber producing capacity at this plant, which was one of the pioneer Buna S installations in the national rubber program.

Synthetic rubber boots for essential war and industrial use are being made at the company's plant at Naugatuck, Conn. These boots are entirely of Buna S except for the rubber cement necessary to make them adhere until they are vulcanized. Company officials report this footwear passes rigid tests most satisfactorily.

John M. Miller, formerly factory manager of the munitions plant operated by U. S. Rubber for the government at Marion, O., and previously assistant factory manager at the company's general products plant at Providence, R. I., has been made factory manager at the Los Angeles, Calif., plant, according to Wm. S. Long, operations manager there.

John E. Caskey, until recently general manager of the explosives division at the Pennsylvania Ordnance Works plant of U. S. Rubber at Williamsport, Pa., has been made manager of the Charlotte plant at Charlotte, N. C., according to E. G. Brown, general manager of the munitions division of U. S. Rubber. Mr. Caskey joined the rubber company as a technical trainee in the Naugatuck Chemical plant at Naugatuck, Conn., following his graduation from Ohio State University in 1915. He worked on the development and operation of aniline oil, one of the first tire rubber accelerators to be used, and was promoted to sectional supervisor. In turn he was advanced to superintendent, assistant factory manager, factory manager, and assistant general manager of the chemical division. Mr. Caskey was placed in charge of the explosives division in April, 1942, when U. S. Rubber took over supervision of operations at the Williamsport plant.

M. P. Lewis has been appointed assistant manager of the newly created cable and wire division of U. S. Rubber, according to C. W. Higbee, manager. Mr. Lewis has been with the company since 1919 when he joined its Bristol, R. I., sales department; he later became eastern division wire sales manager.

Mr. Higbee later announced the appointment of Howard W. Weber as sales manager of the wire and cable department. Mr. Weber has been with U. S. Rubber since 1934 when he entered the sales department.

J. G. Schaefer, of the U. S. Rubber tire division, has issued a set of rules on the use of synthetic camelback, covering buffing, cementing, application, curing equipment, temperature, and time, and handling of tire at completion of cure.

John McGavack, head of the company's wild rubber research, on August 13 discussed the rubber situation before the Rotary Club of Hackensack, N. J.

U. S. Industrial Chemicals, Inc., 60 E. 42nd St., New York, N. Y., recently announced that U. S. Industrial Alcohol Co. has been merged with and into U. S. I. Chemicals in line with the company's increasing interest and growing activities in the broader field of industrial chemicals.

Stauffer Chemical Co., 420 Lexington Ave., New York, N. Y., has appointed Arnold Belchetz director of research and development. Dr. Belchetz has been associated with the Shell Group and the M. W. Kellogg Co. for the past 15 years and is a graduate of Emmanuel College, Cambridge University, England.

Arnold Belchetz

Du Pont Announcements

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., through O. M. Hayden, assistant manager, rubber chemicals division, has announced several changes in the division, effective September 15, and necessitated by the promotion of A. J. Mease, assistant to C. A. Bartle, director of sales, to the assistant managership of the Boston office of the organic chemicals department. S. G. Byam becomes sales manager, and V. A. Cosler sales development manager of the rubber chemicals division, both reporting to Mr. Bartle. A. J. Northam becomes assistant director of the rubber laboratory in charge of sales service; while A. M. Neal continues as assistant director in charge of research. In the absence of the director of the rubber laboratory Mr. Northam will assume his responsibilities.

The du Pont company also announce that commencing September 1, it is permitted by the Office of the Rubber Director to accept without governmental authorization orders for all types of neoprene made at the Deepwater plant, with the exception of Type ILS. Orders, however, must bear the purchaser's certification that the neoprene will be used only in those end products permitted under Rubber Order R-1 and amendments thereto. Although the facilities at the Deepwater plant at Carney's Point, N. J., can be used for either Neoprene Type GN or Neoprene Latex Type 571, the demand for latex has been increasing rapidly, and the production of Type GN at Deepwater will probably decrease eventually to the point where all the production at Deepwater will be Neoprene Latex Type 571. Requirements for Type GN or GR-M will then have to be satisfied from the Rubber Reserve Co., plant at Louisville, Ky., except for emergency shipments as they may arise.

Stanco Distributors, Inc., 26 Broadway, New York, N. Y., has announced that in the manufacture of Perbunan it recently added a material so that the finished product will be decidely more uniform in quality. The addition of this particular chemical has darkened the finished product somewhat, but the manufacturer states that color has no influence whatsoever upon the quality. No difficulty should be experienced in handling the new darker Perbunan, which is reported as being much more constant in quality than the previous lighter colored Perbunan.

The Rubber Manufacturers Association, Inc., Tire Accessories & Repair Materials Committee, 444 Madison Ave., New York 22, N. Y., as a contribution to the conservation of containers has adopted a program under which bulk tire repair materials will be wrapped in paper and recappers will be asked to preserve and return camelback containers so that they may be reused. Individual manufacturers will issue instructions shortly on the proper method of collapsing and returning used camelback containers.

Calco Chemical Division, American Cyanamid Co., Bound Brook, N. J., has named Sidney C. Moody assistant general manager in charge of all departments of the Division. He joined Calco in 1919 and for many years was department sales manager.

The Nineteenth Exposition of Chemical Industries, scheduled to open at Madison Square Garden, New York, N. Y., December 6, will deal with postwar plans as well as reflect the creation of new industries and their products or the conversion of existing plants to new uses. Among products to be exhibited will be hard rubber equipment for handling corrosive chemicals, a heat exchanger section used in making synthetic latex, a synthetic wax to prevent sticking and spoilage of military raincoats in the tropics, and another substance to prevent cracking of synthetic rubbers and resins at low temperatures in the Arctics and in high-flying planes, as well as a complete line of placticizers, wetting agents, and emulsifiers.

The Vulcanized Rubber Co., Morrisville, Pa., has appointed Hilda Pfister assistant advertising manager in charge of printing and direct mail.

New Carrier Installations

Through the use of Ruberoid asbestos board duct work, engineers of Carrier Corp., Syracuse, N. Y., were able to save 78,000 pounds of steel in a recent installation of ventilating and air conditioning equipment in the Mishawaka, Ind., plant of the United States Rubber Co. Carrier provided 16 heat diffusers to supply 100% outside air for spaces with high concentration of ethylene dichloride, methyl ethyl ketone, and isopropyl alcohol. The company also supplied 21 ventilating units for exhaust air purposes. Along with these were three industrial air conditioners with cooling coils for the circulation of well water. This air conditioning equipment is for use in the processing of rubber for self-sealing airplane fuel cell tanks.

Carrier has also supplied U. S. Rubber at Mishawaka with a spray washer for cooling and ventilating in connection with the processing of rubber for Army and Navy raincoats. Heating coils were installed in the same plant for use in the drying process. Because there are concentrated vapors in the room where the rubber is cemented to the fabric, Carrier was called on to provide ventilation for employe health and comfort.

Pittsburgh Meeting

(*Continued from page 573*)

Rayon", and Jack Press and H. Mark have a paper on "Elasticity, Creep, and Recovery of Rayon Yarns" before this Division also. Papers before the Division of Colloid Chemistry on September 9 on "Methods of Electron Diffraction" by L. H. Germer, "Some Progress in the Use of X-Rays in the Field of High Polymers" by I. Fankuchen and H. Mark, and on "The Method of Purifying and Concentrating Colloidal Dispersions by Electrodecantation" by Paul Stamberger should also be worth while. In view of the interest of the rubber industry in synthetic rubbers and plastics, two papers before the Plastics Group of the Division of Paint, Varnish, and Plastics Chemistry on September 7 should be mentioned: "Mechanism of Branching in Polymerization Reactions" by George Goldfinger, W. J. Zybert, and H. Mark; and "Crystallinity and Melting of Linear Polymers" by W. O. Baker and C. S. Fuller. Other papers which might also be of interest in this same connection are those on "Decomposition of Benzoyl Peroxide on Carbon Black" by George Goldfinger and R. P. Rossman, on "Kinetics of Chain Copolymerization" by Robert Simha and Herman Branson and on "Thermodynamics of High Polymer Solutions. II. Dilute Solutions" by Paul J. Flory, to be presented before the Division of Physical Chemistry also on September 7.

New Raw Material for Synthetic Elastomers

A NEW raw material, 2-Vinylpyridine, which is the pyridine analog of styrene and which offers interesting possibilities in the development of synthetic elastomers, was recently announced. The new chemical copolymerizes similarly with butadiene and styrene, and with butadiene and styrene together, to form a synthetic elastomer said to have interesting properties. The material boils at 159° C. (760 millimeters) and can be distilled at about 98° C. at 100 millimeters. It is soluble to the extent of about 2.5% in water and is readily emulsified with water, about 15% of the water dissolving in it. Production of this new material is now under way, and the manufacturer's technical staff will be pleased to consult and cooperate with producers interested in investigating the possibilities of the new material as a modifier in the copolymerization of styrene and butadiene, also in the manufacture of elastomers for specialized uses. Reilly Tar & Chemical Corp.

Oroplasts for Natural and Synthetic Rubbers

A NEW series of sulphur-reactive petroleum products which have been specifically developed for use as compounding ingredients for natural and synthetic rubbers has been announced. Called Oroplasts and varying from a fluid to a very soft solid, these materials are reported as being distinctly different chemically from any petroleum rubber plasticizers previously marketed. The Oroplasts are unsaturated cyclic hydrocarbons whose unsaturation averages two double bonds per molecule, which accounts for their high iodine number and sulphur reactivity. They are soluble in common organic solvents and are resistant to acids and alkalies. Sulphur is soluble in Oroplasts at moderate temperatures and reacts with them at high temperatures. In natural and GR-S rubbers Oroplasts plasticize unvulcanized compounds containing them, and since they react with sulphur, they become an integral part of the vulcanized product. They may be used as extenders and, when used in substantial amounts in compounds, require proportionately more sulphur and fillers to develop optimum physical properties than would corresponding amounts of rubber hydrocarbon. Incorporating time varies with the physical consistencies of the materials, but may be considered as normal for this-type ingredient. The three grades L, M, and H, are all dark brown in color and have specific gravities of 0.96, 0.98, and 1.02 respectively. Advance Solvents & Chemical Corp., 245 Fifth Ave., New York, N. Y.

New Chemicals for GR-S

A NEW chemical peptizer for GR-S and a solid form of refined gum turpentine have recently been announced by J. M. Huber, Inc., 460 W. 34th St., New York, N. Y. The peptizer, called JMH, is a brown powder with a specific gravity of 1.39, and a melting range of 86-91° C.; and although it is reported to have excellent stability it is recommended that it be stored in a cool place. At present it is adapted only to Banbury milling technique, requiring three to five minutes mixing at approximately 325° F. It should be added to the polymer alone, and the plasticizing completed before any other ingredients are added, after which the GR-S can be compounded and processed in very much the same manner and at the same operating temperatures as crude rubber. No effect on the rate of cure or tensile strength has been found while elongation is increased and the modulus decreased. Resistance to flex cracking is somewhat improved, and aging properties are not affected. The material is not suitable to light-colored goods and it may cause dermatitis to some people by direct contact, but since it is completely destroyed in the peptizing action, no health hazard after the rubber is plasticized is considered possible. The use of about 1% of JMH is reported to reduce the Mooney plasticity of GR-S from about 50 to 25.

In order to adapt refined pure gum turpentine for use in some plants it has been necessary to make it available in solid form. This new grade called Turgum S, has a softening point (ball and ring) of 139-144° F. and may be added directly to the rubber batch without previously melting. Laboratory tests indicate that 8½ parts of Turgum S will replace 10 parts of Turgum without noticeable difference in results, and the same excellent crude physical characteristics, including resistance to cut growth, are obtained.

OHIO

Goodrich Announcements

Chemists of The B. F. Goodrich Co., Akron, have developed jar sealing rings of non-critical materials, according to Howard E. Fritz, director of research. Two different types of rings are already in mass production. One, of Koroseal, is used for low heat packs; while the other is a vulcanizable linseed oil compound combined with various secret ingredients. In appearance the rings are almost identical with rubber standard ones. The tensile strength and elasticity of the vulcanized linseed oil rings are not so high as those of rubber, but for food packing the rings need have only fair tensile strength, good compressibility, low porosity, and resistance to heat. Use of these new sealing rings has been confined to packing products which do not rate rubber rings, but whose processors are able to obtain a fairly high priority rating for use of materials substituting for rubber. The rings will not be available for household canning purposes.

For the first time in history, women are on the tire machines at the Goodrich plant in Akron. The feminine force, numbering 100, began training two months ago, and their work has proved entirely satisfactory, company officials said. The heaviest part of the women's work is removing the tire from the drum on which it is built and tossing it up on the hook of the conveyer system that carries it away for curing and vulcanization. The women tire builders are paid the same rate as men get for the same jobs.

Goodrich employes held their annual play day at Summit Beach Park on August 12. The outing was marked by sports events, dancing, professional entertainment, and awarding of prizes for the various contests. The affair ran from 9:00 a. m. to 2:00 a. m. the next morning to allow the attendance of all employees after work hours as regular production schedules were observed at the company plants that day.

John L. Collyer, Goodrich president, on "The Farm Forum" over Station WGY, Schenectady, N. Y., on August 6 discussed the relation of the rubber industry and agriculture, with stress on rubber tires for farm equipment. He also touched upon the synthetic rubber program and rubber from the Far East when no longer under Japanese domination.

Dr. Fritz recently appeared before cameras of WRGB, General Electric Co.'s television station in Schenectady, N. Y., during a program on which he demonstrated the process of making synthetic rubber.

A. D. Eastman has been made director of training and testing of the salary personnel division at Goodrich, according to Charles V. Molesworth, division director. Mr. Eastman formerly was dean of freshman, director of admissions, and an assistant professor at Kenyon College.

General Tire & Rubber Co., Akron, on the Yankee Network, which it controls, and Station WJW, Akron, has launched a Sunday afternoon radio show known as "Thanks to America." The program is largely musical although comment by Prof. William L. Stidger, of Boston University, is featured. Regular spots in the program are held by a trio, the General Tire orchestra, and a tenor, with weekly guest artists. The broadcast originates at Yankee Network headquarters in Boston, Mass., and is heard at 5:30 p. m. Sunday afternoons.

The Timken Roller Bearing Co., Canton, has appointed The Coulter-Sibbett Steel Co., Los Angeles, Calif., Arizona and southern California as well as northern California distributor of Timken Graphitic steels. Appointment of The Coulter-Sibbett Steel Co. follows dissolution of Coulter-Sibbett & Burke, who was former distributor.

S. R. Kallenbaugh has been appointed West Coast district manager of Timken's steel and tube division, with headquarters at 1526 S. Olive St., Los Angeles, Calif. Mr. Kallenbaugh formerly was metallurgical service representative for Timken in Cleveland and Detroit.

Firestone Notes

Firestone Tire & Rubber Co., Akron, at a recent board meeting elected Harvey H. Hollinger secretary of the company to succeed the late B. M. Robinson. C. A. Pauley succeeds Mr. Hollinger as comptroller, a position the latter held 15 years. He had joined the company 30 years ago as an accountant. Mr. Pauley came to Firestone as an auditor in 1931 and recently had been head of the subsidiary auditing division.

Firestone Aircraft Co. on July 29 acquired G & A Aircraft, Inc., Willow Grove, Pa., manufacturer of gliders and autogiros.

Firestone recently announced that its developed tool for loosening airplane tire beads from the rims has also been found satisfactory for loosening truck tire beads from rims, including huge earth-mover varieties.

William E. Duck, managing director of the Firestone plant at Brentford, England, is in this country conferring with Firestone executives and others on business connected with the war effort.

After a year and a half of active service as a lieutenant in the U. S. Navy, Leonard K. Firstone has been placed on inactive duty to enable him to return to war production as president of the Los Angeles, Calif., plant of the Firestone company, succeeding R. J. Cope, who retired because of ill health.

Capt. Raymond C. Firestone, former head of the Firestone plant in Memphis, Tenn., recently was assigned to the Ferrying Division of the Air Transport Command with headquarters in Cincinnati.

The Galey Mfg. Co., maker and marketer of GY-4, a plasticizer for synthetic rubbers, has moved its offices to 17700 Lake Shore Blvd., Cleveland, where more space is available.

A. Schulman, Inc., Akron, on August 15 celebrated its fifteenth anniversary as a scrap rubber dealer. The affair was marked by a dinner limited to the members of the Schulman organization.

Left to Right: Ben Gordon, Sales; George Jatinen, Assistant Manager, Boston Mass., Branch; Dave Lundquist, Manager, Boston Branch; Alex Schulman, President; Irving Schulman, Assistant Secretary; Doris Kushkin, Assistant Treasurer; George Woloch, Secretary-Treasurer; S. A. Tanney, Sales; Milton Kushkin, Manager, St. Louis, Mo., Branch *(Photo at Right)*

Employes and Executives of A. Shulman, Inc., Scrap Rubber Dealer, Akron, Celebrating the Firm's Fifteenth Anniversary at a Dinner

Goodyear News

Because of greatly increased war uses for Pliofilm, the Goodyear Tire & Rubber Co., Akron, has resumed its production at the plant in St. Marys. A. F. Landefeld, manager of Goodyear's Pliofilm department, also announced that Pliofilm production is being increased 10% in the Akron plants owing to improvements in processes. Widely used in peacetime for moisture-proof packaging of all kinds and for wearing apparel, shower curtains, and umbrellas, Pliofilm is being used exclusively today by the U. S. Army and Navy to protect airplane engines and parts.

After Pearl Harbor, the Pliofilm units at St. Marys were closed to conserve rubber, later being converted to production of fireproofed and moisture-proofed canvas duck for U. S. Army tents. One unit at St. Marys is already back into Pliofilm production. Another is scheduled to resume on September 15 and the third on November 1.

Work has started on new quarters for the Goodyear-OXO Co. Located near Lecheria, in the state of Mexico, the new building, especially designed to fit the needs of the business, will be modern and up to date in every detail. Goodyear-OXO, however, will not move into its new home until the expiration of the lease on its present rented quarters, some time next year. The company is an affiliation of Goodyear and Compania Hulera Oxo.

Goodyear, according to L. E. Judd, director of public relations, has retained the firm of H. A. Bruno & Associates, 30 Rockefeller Plaza, New York 20, N. Y., as public relations counsel, who will give special attention to aeronautical activities.

Goodyear also recently announced the following appointments: W. W. Vogt, manager of the tire and chemical divisions, responsible to R. P. Dinsmore; F. J. Dugan, chief compounder of the company; Victor Holt, assistant manager of the tire departments.

P. W. Drew, of Goodyear Tire & Rubber Co. of California, Los Angeles, will discuss "War Tires, Availability and Performance Characteristics" at the West Coast Transportation and Maintenance Meeting of the Society of Automotive Engineers, scheduled August 19 and 20 in the Palace Hotel, San Francisco.

New Developments

After more than a year of research, Goodyear has perfected a method of producing foamed synthetic rubber latex for seat cushions and similar purposes, said to be comparable in most qualities to prewar Airfoam made with natural rubber latex, according to W. C. Winings, manager of Goodyear's mechanical goods division. The synthetic rubber product is black, however, to identify it from the light gray prewar Airfoam. The same wide range of densities is possible with both types.

In most cases synthetic rubber Airfoam is much more highly resistant to oil, acids, gasoline, and similar materials than is the natural rubber product. Both types, however, more than meet the R. M. A. qualifications on flex life. Synthetic Airfoam also is generally more resistant to high temperatures over long periods than natural rubber Airfoam, according to extensive tests, and, in addition, will not support combustion.

Rubber Sole and Heel on Ski-Troop Boot

Natural-rubber Airfoam is permitted to seal bomb-bay doors, pilot cabins, and other apertures in warplanes as well as to seal doors and ports of military tanks from rain and sand. It is being used also in the oxygen masks of high-altitude fliers; while it is likewise available for its shock-absorbing qualities to cushion flight and fire control instruments on battleships and warplanes. Other quantities of pre-Pearl Harbor Airfoam, intended originally for mattresses, furniture seats, automobile cushions, etc., are being used for gunwale padding on small U. S. Navy boats which carry personnel and supplies to seaplanes moored off shore. The Airfoam protects the tender shells of the aircraft.

Windsor Mfg. Company, Goodyear subsidiary at Windsor, Vt., is manufacturing rubber soles and heels for footwear for mountain ski troops of the U. S. Army, following a design originally worked out by the Italians. The footwear utilizes a pattern said to provide perfect traction on stone and ice, replacing steel cleats. Longer wearing than the latter, the new sole and heels design developed by Goodyear and the Quartermaster Corps, has an added value in the fact that troops using this footwear can creep almost silently over the flintiest surfaces. Besides there is no danger of betraying sparks at night. Other advantages claimed for this footwear follow: rubber heels and soles are warmer with no metal to conduct heat away from the soldier's feet; such soles and heels are more waterproof than the leather on which cleats are mounted in conventional boots; the new boots are lighter and thus less fatiguing than the old type; each time the boot is flexed it automatically cleans itself of snow or ice.

Chemical Developments Corp., 314 W. First St., Dayton, has announced the following additions to its technical staff: Melvin A. Crosby, chief engineer; Gordon M. Williams, John R. Fisher, Jr., and Elizabeth D. Strickland, research chemists; and Lena Ranis Ziegler, patent chemist.

MIDWEST

Safety Congress and Exhibition

The National Safety Council, 20 N. Wacker Dr., Chicago, Ill., will hold its annual safety convention and exposition October 5-7 at the Sherman, La Salle, and Morrison hotels in Chicago. Expected are more than 500 program participants in 200 sessions, and the list of exhibitors for the exhibition to date exceeds 150.

The Rubber Section has outlined the following programs for the afternoon of October 5 and the morning of October 6 in the Rose Room of the Sherman Hotel:

"Report of Sectional Activities", General Chairman John L. Grider, personnel manager, Gould & Eberhardt, Newark, N. J.

"Safety Training in Wartime", John I. Yellott, chairman, safety training committee, Illinois Institute of Technology, Chicago.

"Highlights in the Placement of Women in Industry", Ruth Stone, chief women's placement section, Western Electric Co., Inc., Chicago.

"Health Problems of Women in Industry", C. O. Sappington, industrial health consultant, Chicago.

General Discussion, led by R. W. Fickes, safety director, Goodyear Aircraft Corp., Akron, O.

"Women in Industry" (motion picture), Paul Van Cleef, of Van Cleef Bros., Chicago.

Election of 1943-44 Officers.

"Rubber Section Safety Contest 1942-43 Report", and presentation of awards by J. I. Banash, consulting engineer, Chicago, and past president, N. S. C.

"Mechanical Safety in Plants Manufacturing Synthetic Rubber", E. T. Handley, manager of production, Synthetic Plants, Firestone Tire & Rubber Co., Akron.

Discussion.

A Symposium—"Solvents for Synthetic Rubber": "Safe Use of Solvents", Leonard Greenburg, executive director, Division of Industrial Hygiene, New York State Department of Labor, New York, N. Y.; "Ventilating Problems", Bernard Offen, owner and chief engineer, B. Offen & Co., Chicago; "Dermatitis", W. E. Obetz, medical investigator, Industrial Commission of Ohio, Columbus; General Discussion, led by Warren A. Cook, director, industrial hygiene and engineering research division, Zurich General Accident & Liability Insurance Co., Chicago.

Monsanto Chemical Co., St. Louis, Mo., August 3, revealed following organization changes effective November 1. William M. Rand, Monsanto, vice president and general manager of the Merrimac division with headquarters at Everett, Mass., was elected to the executive committee of the company, with headquarters in St. Louis. Daniel S. Dinsmoor, assistant general manager of the organic chemicals division with headquarters in St. Louis, has been elected a vice president of the company and will succeed Mr. Rand in the Merrimac division. Julius A. Berninghaus, general manager of the organic chemicals division, with headquart-

ers in St. Louis, will retire on November 1, at age 65, a compulsory requirement under the company's retirement pension plan. He will continue his active participation in the company's business, however, in an advisory capacity to his successor, Osborne Bezanson, vice president of the company and general manager of the Texas division, with headquarters at Texas City, Tex. The Texas division, with plants at Karnack and Texas City, Tex., will be consolidated with and become a part of the organic chemicals division.

The WPB has approved construction of additional manufacturing facilities for Resinox phenolic resins and molding compounds at Monsanto's plastics plant at Springfield, Mass., according to Vice President John C. Brooks. The new facilities, made necessary by an increased demand for high impact phenolic plastics compounds in war applications, will be devoted entirely to high-priority war applications and will not relieve the critical situation on phenolic materials.

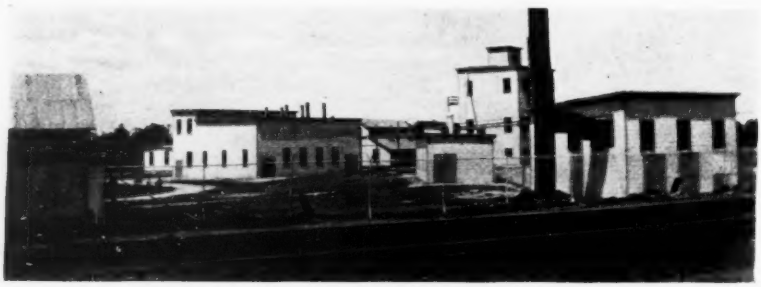
F. N. Bard, president, Barco Mfg. Co., 1810 Winnemac Ave., Chicago, Ill., is chairman of the special committee of the Illinois Manufacturers Association to make a thorough study of the renegotiation of government contracts.

NEW ENGLAND

The Warwick Chemical Co., West Warwick, R. I., last month purchased property at Wood River Junction, R. I., from the Walker Chemical Co. This property, on the main line of the New Haven Railroad, covers 26 acres. Construction of a modern factory was begun in 1939 to manufacture military nitrocellulose for the French Government. However, just before completion France fell, and the factory was never put into operation. Now Warwick Chemical Co. is rebuilding the entire plant, which will be devoted to manufacturing fine chemicals.

Farrel-Birmingham Co., Ansonia, Conn., at a recent board meeting elected Lester D. Chirgwin, general manager of the Buffalo, N. Y., plant, a director of the company. He originally started working for Farrel in April, 1909, as office boy in Ansonia. Then he entered Yale University in 1911, graduating in 1914 with the degree of mechanical engineer; he spent his vacations working in the company's machine shops. Following graduation, Mr. Chirgwin became a draftsman for the Ansonia firm, and after two years was placed in charge of estimating and then also in charge of the order department. He later headed both departments until April, 1918, when he joined the Emergency Fleet Corp. of the United States Shipping Board as an expediter. But he returned to Farrel in May, 1919, in the engineering department and later was transferred to the sales department. In August, 1920, Mr. Chirgwin was sent to the company's new plant at Buffalo as assistant to the general manager. He was made production manager in 1923, assistant general manager in 1930, and general manager of the Buffalo division in January, 1943.

Lester D. Chirgwin



Plant Recently Purchased by Warwick Chemical Co.

CANADA

Rubber Controller Alan H. Williamson, Ottawa, Ont., issued an order, effective midnight July 30, whereby used tires and tubes may be purchased only with a ration permit similar to the one for new tires. Previously used tires could have been purchased merely by filling out a certificate of necessity, but it has become necessary to conserve dwindling tire stocks. The new order establishes three classes of tire buyers and rules all other ineligible to buy any usable tire or retreading service, and also revises the lists of eligible vehicles. The order, moreover, allows for the first time since rationing went into effect the retreading of tires for vehicles in Class "C." It redefines "authorized dealer" and thus prevents anyone from selling tires or tubes if he did not sell at least 75% of his purchases of tires and tubes to the public in the year ended October 31, 1941, and also compels every authorized dealer to retain turn-in tires for 30 days to allow for possible government inspection. The order forbids anyone from disposing in any way of a usable tire or tube except by permit or legal sales between dealers and manufacturers or by sale, loan, or exchange of the vehicle itself. The new order, which rescinds all previous tire orders and rulings, also establishes a revised schedule of ceilings on used tires.

Deputy Rubber Controller J. A. Martin, Ottawa, Ont., recently issued an order prohibiting the advertising in the Dominion of synthetic rubber or of products made from vulcanizable synthetic rubber. Advertising is interpreted as meaning "all forms of publicity."

Agricultural Supplies Board, Ottawa, Ont., reports that farmers in Peterborough County are growing 600 acres of milkweed as part of a rubber experimental project at the request of the Munitions and Supplies Department. The Ontario Agriculture Department is instructing and supervising farmers who are growing a specified acreage under contract. Besides a quantity of leaves and seed pods from native stands of milkweed will be collected by school children under arrangement with local school officials. A small pilot plant will be used to extract the rubber from the milkweed which will be mixed with synthetic rubber in a series of experiments by the National Research Council.

Dominion Rubber Co., Ltd., Montreal, P. Q., has appointed Wilbur A. McCurdy assistant director of purchases. Starting with the firm in 1916, Mr. McCurdy was connected with the manufacturing units in Granby, P. Q., and Montreal and became customs auditor at the company's head office before joining the purchasing department.

George W. Sawin, president and general manager, B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchner, Ont., in an interview in Winnipeg, Man., August 16 stated that the Dominion is facing the worst rubber crisis of the war with stockpiles of finished goods down to a "serious level" and war requirements undiminished.

C. D. Howe, Minister of Munitions and Supply, recently told the House of Commons, Ottawa, Ont., that the anticipated 41,000-ton output of synthetic rubber from the government-owned Polymer Corp. plant at Sarnia, Ont., already has been earmarked for direct war purposes and other essential needs, and the ordinary civilian can expect no relief from it from the rubber shortage. Reporting generally on the rubber situation in Canada, Mr. Howe further stated that consumption of rubber for civilian purposes has been reduced to 10% of the prewar figure, and of this 10% tires are being provided only for essential vehicles. Restrictive orders alone are not responsible for this saving; much is the result of the use of substitutes and reclaim in essential articles. This progressive reduction in the use of rubber is still going forward, the speaker added, and technical experts are devising new formulae for substitutions; as soon as they are tested, their use is made compulsory.

Seiberling Rubber Co., Ltd., Toronto, Ont., is erecting an extension to its plant consisting of a two-story portion 104 by 60 feet and an additional one-story section 104 by 80 feet. The new structure will be used for housing Banbury and mill for processing synthetic rubber, along with storage facilities. The addition is necessary so that the company may continue to operate at the present rate of capacity when the conversion program, from natural to synthetic rubber, is complete. It is expected that the building and installation of equipment will be finished in October.

OBITUARY

Harold D. Cameron

ONE of the 20 victims of the airplane crash near Louisville, Ky., on July 28 was Harold D. Cameron, since December 23, 1940, superintendent and organizer of the lighter-than-air department of the General Tire & Rubber Co., Akron, O., where he also helped design the ballonet type of balloon. Previously, from June 8, 1917, to December 21, 1940, Mr. Cameron had been employed by The Goodyear Tire & Rubber Co., Akron, where he had been in charge of the balloon department until 1929, when he moved into the mechanical goods division. The deceased made barrage balloons and blimps during World War I.

He was born at Sandusky, O., on February 19, 1894. He was graduated from the Case School of Applied Science in 1917 with a B.S. degree in electrical engineering. He worked for Western Electric Co. and then National Carbon Co., both in Cleveland, O., before joining Goodyear.

Funeral services were held August 9, with burial in Oakwood Cemetery, Cuyahoga Falls, O.

He leaves his wife and two sons.

A. S. Hardy

FOLLOWING a long illness, Alpheus Sumner Hardy, affiliated with the Manhattan Rubber Mfg. Co., Passaic, N. J., from 1903 until he retired the end of 1934, died at his summer home in Mattapoisett, Mass., on August 3. In the interests of the Manhattan company, of which his father, Alpheus H. Hardy, had been a founder and a director, the deceased made many trips over the globe in connection with the cultivation of rubber. In 1910 he acquired control of the Lebak plantations in Java. He was also a director of Manhattan Securities Co., owner of the plantation.

Mr. Hardy was born in Bombay, India, October 6, 1864, of American parents and brought up in Boston, Mass. He attended Boston Latin School and Harvard College, from which he was graduated with an A.B. degree in 1887. Then he worked, successively, for a wholesale footwear concern in Chicago, Ill., the New England Telephone Co., and Otis Bros. & Co., elevator manufacturers, before entering the rubber industry.

He belonged to the Harvard Club of New York, Beverly and Mattapoisett Yacht clubs, Military Order Loyal Legion of the United States, Delphic Club of Harvard, and Union Boat Club of Boston.

Funeral services were conducted August 5 at Grace Episcopal Church, New Bedford, Mass. Burial was in Milton Cemetery, Mass.

Survivors include the widow, a daughter, a granddaughter, a grandson, a brother, and two sisters.

Robert R. Dornan

A HEART attack caused the death, on August 1, of Robert Reach Dornan, vice president and a director of Rubberset Co., 56 Ferry St., Newark, N. J. He had joined the company on June 4, 1936, as a salesman, becoming sales manager in charge of paint brushes on August 16, 1939, vice president in charge of paint brush sales on June 1, 1941, and a director in 1943.

Mr. Dornan was born in Philadelphia, Pa., November 9, 1900. He was graduated from Rutgers University in June, 1922, with a B.S. in civil engineering. He was a member of Delta Kappa Epsilon fraternity.

Funeral services were held in Philadelphia on August 4, with interment in Mount Moriah Cemetery, Philadelphia.

A ten-year-old daughter survives.

FINANCIAL

American Cyanamid Co., New York, N. Y., and subsidiaries. First six months, 1943: net income, $3,229,534, equal to $1.22 a common share, against $2,395,373, or 91¢ a share, in the first half of 1942; provision for taxes, $10,421,690, against $7,183,960.

American Zinc, Lead & Smelting Co., Columbus, O., and wholly owned subsidiaries. First half, 1943: net profit $484,360, or 40¢ a common share, against $557,580, or 57¢ a share, in the first six months of 1942.

Anaconda Wire & Cable Co., New York, N. Y. June half, 1943: net income, $468,431, or $1.11 a share, against $865,043, or $2.05 a share, in the first half last year.

Belden Mfg. Co., Chicago, Ill. First six months, 1943: net income, $2,467,629, equal to $1.02 a share, against $217,011, or 90¢ a share, in the first half of 1942; net sales, $5,597,881, against $4,596,681.

Canada Wire & Cable Co., Ltd., Leaside, Ont., Canada. First half, 1943: net profit after all charges, $546,136, equal to $15.67 each on 29,669 shares of Class "A" common stock outstanding, against $274,736, or $6.52 a share, in the same period last year; provision for income and excess profits taxes, $1,537,960, against $1,066,000.

Columbian Carbon Co., New York, N. Y. First half, 1943: Consolidated net earnings, $1,502,365, equal to $2.80 a share, against $1,546,156, or $2.88 a share, in the 1942 period.

Crown Cork & Seal Co., Inc., Baltimore, Md., and wholly owned domestic subsidiaries. First half, 1943: net profit, subject to renegotiation, $711,606, or 89¢ a common share, against $752,790 (adjusted), or 97¢ a share, in the corresponding half of 1942; provision for federal income and excess profits taxes, $1,312,124, against $1,245,556.

Crown Cork International Corp., Jersey City, N. J., and wholly owned domestic subsidiary. First half, 1943: net income, $97,123, against $97,839, in the same period of 1942.

De Vilbiss Co., Toledo, O. For 1942: net income $442,622, equal, after preferred dividends, to $4.13 each on 98,659 common shares; federal income and excess profits taxes, $443,478.

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., and wholly owned subsidiaries. June quarter, 1943: net profit, $14,816,186, equal to $1.16 a common share, against $11,643,287, or 87¢ a share, in the 1942 quarter; net sales, $142,356,001, against $121,403,008; provision for federal income taxes, $31,291,000 against $32,070,000. First half, 1943: net income, $29,555,500, equal to $2.32 a common share, compared with $25,953,444, or $1.99 a share, in the same period last year; federal income taxes, $60,848,000, against $63,320,000.

Electric Storage Battery Co., Philadelphia, Pa., and wholly owned subsidiaries. First half, 1943: net income, $1,012,245, or $1.11 a share, against $932,593, or $1.03 a share, in the corresponding half of 1942; reserve for contingencies and taxes, $3,473,100, against $2,029,818.

Dewey & Almy Chemical Co., Cambridge, Mass. First half: net income, $289,047, or 98¢ each on 295,317 shares, against $238,570, or 81¢ a share in the 1942 period.

Flinkote Co., New York, N. Y., and subsidiaries. Sixteen weeks to July 17: net income, $335,705, from which was deducted $100,000 provision for renegotiation and post-war contingencies, contrasted with $384,841 in the 16 weeks ended July 18, 1942; provision for taxes $304,342, against $1,566,746.

General Cable Corp., New York, N. Y. First half, 1943: net income, $1,041,888, against $1,367,623 in the first six months last year; provision for federal taxes, $4,670,000, against $6,975,000.

The B. F. Goodrich Co., Akron, Ohio. First half: consolidated net profit, $5,573,879, equal, after preferred dividends, to $3.49 each on 1,303,255 common shares outstanding, contrasted with $3,103,087, or $1.59 a share, in the 1942 period; net sales, $179,161,773 (a record), against $103,283,542; provision for taxes, $30,773,000, against $14,068,000; reserve for contingencies, $4,000,000, against $1,000,000; current assets, June 30, 1943, $125,522,097 current liabilities, $44,655,566.

Goodyear Tire & Rubber Co., Akron, O. First six months, 1943: net profit, $7,348,529, equal to $2.82 a common share, compared with $4,123,961, or $1.24 a share, in the corresponding half last year; net sales, $366,269,545, against $179,755,599; federal income and excess profits taxes, $40,643,051, against $10,000,000; provision for contingencies, $3,000,000, against $1,500,000; net working capital, June 30, 1943, $130,940,387, against $111,890,781 a year ago.

Intercontinental Rubber Co., New York, N. Y., and subsidiaries. First half: net income, $384,181.87, equal to 64¢ each on 595,832 capital shares, against $177,553.93, or 29¢ a share, in the same period last year; provision for taxes, $201,351.20, against $176,545.80; current assets, including $1,661,022.61 cash, $3,195,758.45 on June 30, 1943, compared with $2,941,458.61, including $2,022,871.55 cash, December 31, 1942; current liabilities, $381,913.53, against $282,301.07.

General Electric Co., Schenectady, N. Y. First half, 1943: net profit, $21,061,629, or 73¢ a common share, contrasted with $20,681,433, or 72¢ a share, in the first six months of 1942; provision for federal income and excess profits taxes, contingencies, etc., $136,000,000, against $94,000,000; net sales billed, $626,871,716, against $412,383,825; orders received, $941,529,300, against $865,372,069.

Master Tire & Rubber Corp., Findlay, O. First half: net income, $158,742, against $64,331 in the like 1942 period.

National Lead Co., New York, N. Y. First half, 1943: net profit, $2,248,954, eequal to 40¢ a common share, against $1,977,827, or 31¢ a share, in the first six months of 1942; federal income and excess profits taxes, $4,754,916, against $5,618,550.

New Jersey Zinc Co., New York, N. Y. June quarter: net income, $1,712,785, or 87¢ a share, against $2,152,984, or $1.09 a share, in the second quarter last year. First half, 1943: net income, $3,449,276, or $1.75 a share, against $4,444,318, or $2.26 a share, in the first six months of 1942.

O'Sullivan Rubber Co., Inc., Winchester, Va. For 1942: net income, $143,478, equal to $1.18 each on 100,000 shares, against $174,807 in 1941.

Phelps Dodge Corp., New York, N. Y., and subsidiaries. First half: consolidated net profit, $6,777,740, equal to $4.34 each on 5,071,260 outstanding shares, compared with $5,532,999, or $1.09 a share, in the first six months last year; provision for income and excess profits taxes, $10,300,000, against $9,200,000; reserve for renegotiation of war contracts and post-war contingencies, $1,000,000, against $250,000 reserve for war losses.

Phillips Petroleum Co., Bartlesville, Okla. First half, 1943: net profit, after taxes, $7,345,315, or $1.62 a common share, against $6,731,420, or $1.51 a share, the same period last year; federal income taxes, $6,270,000, against $3,225,000.

Rome Cable Corp., Rome, N. Y. Second quarter, 1943: net profit, $125,914, or 66¢ a share, against $65,898, or 34¢ a share, in the June quarter, 1942.

St. Joseph Lead Co., New York, N. Y. First half: net profit, $2,697,084, equal to $1.38 each on 1,955,680 outstanding shares, against $2,142,208, or $1.09 a share, in the first half of 1942; provision for federal income and excess profits taxes, $1,468,200, against $3,895,785.

Skelly Oil Co., Kansas City, Mo., and subsidiaries. First half, 1943: net income, $2,566,675, equal to $2.61 each on 981,348 outstanding common shares, compared with $2,208,469, or $2.25 a common share, in the first six months of 1942; provision for income and excess profits taxes, $2,319,200, against $2,403,000.

Timken Roller Bearing Co., Canton, O. First six months, 1943: net profit, $3,112,832, or $1.29 a share, contrasted with $2,779,504, or $1.15 a share, in the first half last year; reserve for contingencies, $2,000,000, against $4,036,000; provision for income taxes, $1,938,500, against $3,381,200; excess profits tax, $12,435,000, against $10,080,000.

Viceroy Mfg. Co., Ltd., Toronto, Ont., Canada. Year ended February 28, 1943: net profit, $49,580, against $80,368 in the previous fiscal year. The company paid no common dividends during the past fiscal year, compared with $1 a share the year before, but it reduced its bond mortgage by $125,000 and redeemed 3,250 preference shares and 65 funding rights.

United States Rubber Co., New York, N. Y. First six months, 1943: net income, after all charges, $6,912,466, equal after 8% preferred stock dividends of $4 a share, to $2.44 each on 1,759,092 common shares, contrasted with $1,554,841, equal, after all charges including war losses of $2,741,649, to $2.39 a preferred share, in the same period last year; consolidated net sales, exclusive of business done for the government on a cost plus fixed fee basis, $202,718,494, against $130,814,895; provision for taxes, $17,820,414, against $13,189,822.

Dividends Declared

Company	Stock	Rate	Payable	Stock of Record
Canada Wire & Cable Co., Ltd.	Class A	$1.00 q.	Sept. 15	Aug. 31
Canada Wire & Cable Co., Ltd.	Class B	0.25 q.	Sept. 15	Aug. 31
Canada Wire & Cable Co., Ltd.	6½% Pfd.	1.625 q.	Sept. 15	Aug. 31
Crown Cork & Seal Co., Inc.	Cum. Pfd.	0.5625 q.	Sept. 15	Aug. 31
Crown Cork & Seal Co., Inc.	Com.	0.25	Sept. 17	Aug. 31
Detroit Gasket & Mfg. Co.	6% Cum. Pfd.	0.30 q.	Sept. 1	Aug. 14
Dewey & Almy Chemical Co.	Class B	0.25 q.	Sept. 15	Sept. 1
Dewey & Almy Chemical Co.	Com.	0.25 q.	Sept. 15	Sept. 1
E. I. du Pont de Nemours & Co., Inc.	Pfd.	1.125 q.	Oct. 25	Oct. 8
E. I. du Pont de Nemours & Co., Inc.	Com.	1.00 inter.	Sept. 14	Aug. 23
Electric Hose & Rubber Co.	Com.	5.90 irreg.	Aug. 20	Aug. 13
B. F. Goodrich Co.	Pfd.	1.25 q.	Sept. 30	Sept. 17
B. F. Goodrich Co.	Com.	0.50 incr.	Sept. 15	Sept. 3
Okonite Co.	6% Pfd.	1.50 q.	Sept. 1	Aug. 16
Raybestos-Manhattan, Inc.	Com.	0.375	Sept. 15	Aug. 31
Thermoid Co.	Pfd.	0.75 q.	Sept. 15	Sept. 1
Thermoid Co.	Com.	0.10 q.	Sept. 15	Sept 1

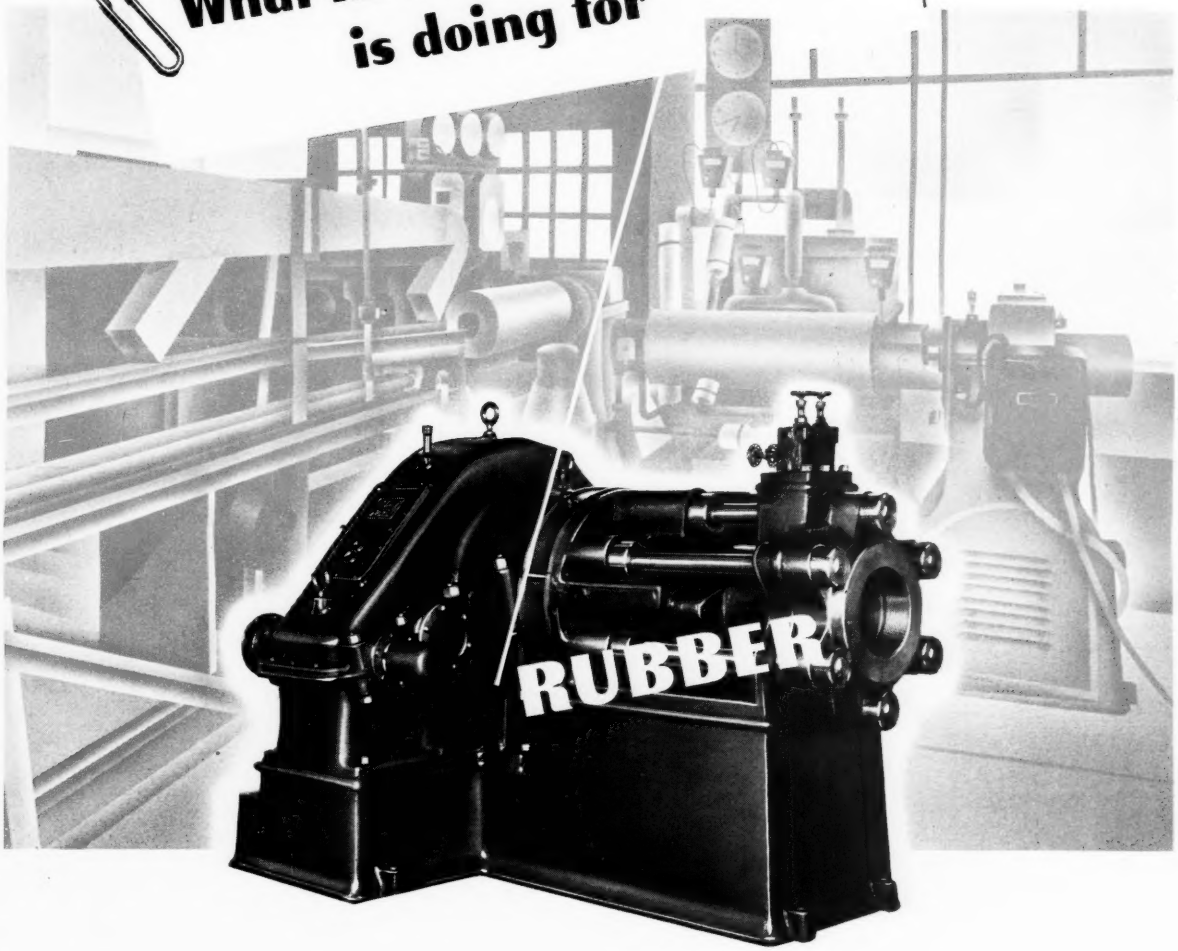
Scrap Rubber Ceilings

	¢ per L.b.
Inner Tubes†	
No. 2 passenger tubes	7¾
Red passenger tubes	7½
Passenger tubes	6

	$ per Short Ton
Tires‡	
Mixed passenger tires	20.00
Beadless passenger tires	26.00
Solid tires	36.00
Peelings†	
No. 1 peelings	47.50
No. 2 peelings	47.50
No. 1 light colored (zinc) carcass	52.50
Miscellaneous Items‡	
Air brake hose	25.00
Miscellaneous hose	17.00
Rubber boots and shoes	33.00
Black mechanical scrap above 1.15 sp. gr.	20.00
General household and industrial scrap	15.00

† All consuming centers except Los Angeles.
‡ Akron only.
‡ All consuming centers.

What Research in Plastics is doing for



HERE at National we have been doing a good deal with plastics the past few years. It is perfectly natural that we should. Within limits, the handling and processing of plastic materials is much like that of natural rubber, and the similarity to synthetic rubber is striking. You might call them sister industries.

At any rate, we found our years of experience designing and building rubber machinery immensely helpful in developing a complete line of plastics extruders and auxiliary equipment. Today there are more National plastics extruders in operation than all other makes combined.

What does that mean to the rubber industry? Here is an example:

Extensive development work in plastics now has enabled us to bring about major advances in rubber extruders. Characteristics of the screw, heat transfer, the type of drive —these are just a few of the factors which have been profoundly affected. They add up, however, to more pounds per hour at lower working temperatures, for synthetic as well as natural stocks.

To rubber fabricators this means performance. To us it means progress and the opportunity to serve you better than ever before. Our engineers are ready to help solve individual problems.

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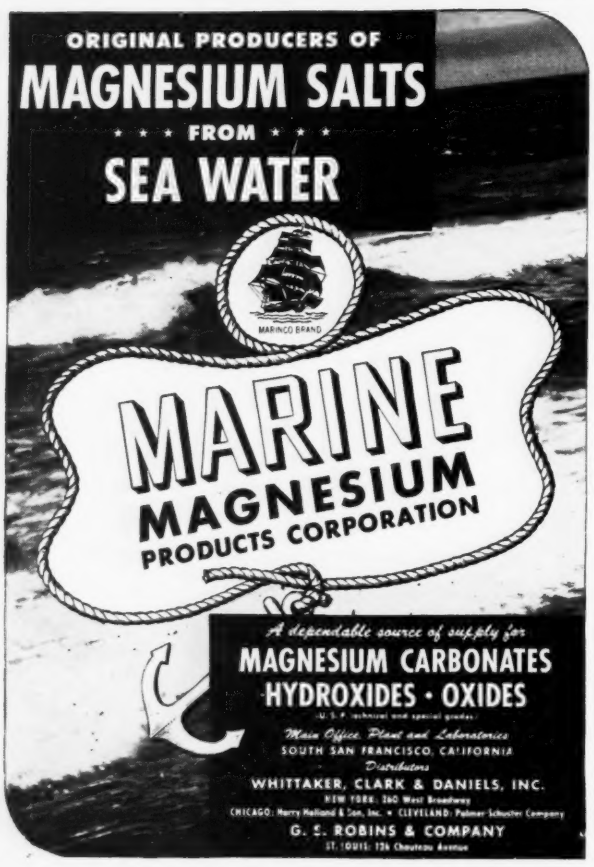


LATIN AMERICA

MEXICO

To make the best possible use of available supplies of rubber, the Mexican Government has issued various orders which aim to reserve the rubber for the most necessary purposes. A decree of May 18, 1943, provides that all rubber, including reclaim and imported rubber, is to be apportioned among manufacturers of the following goods and in the following priority order: (1) indispensable articles for the Army and Navy; (2) articles for the medical and surgical services; (3) tires and tubes for motor vehicles and bicycles; (4) rubber for retreading or repairing tires and tubes; (5) rubber rim linings; (6) industrial hose; (7) belting; (8) insulation rubber; (9) diaphragms for bottling machines; (10) diaphragms for industrial uses; (11) rubber for non-substitutable packing. The manufacture of all other rubber articles is prohibited, and the export of rubber and rubber articles is also forbidden, except to fulfill international agreements.

All rubber produced in the country or imported must be sold to the Sociedad Importadora, Distribuidora y Exportadora de Hule, which will apportion the rubber among the manufacturers according to the quotas fixed by the Ministry of National Economy; the latter also is charged with the distribution of finished goods among dealers.

Furthermore a decree of July 7, 1943, forbids the erection of new factories for the manufacture of rubber goods.

For some years before Pearl Harbor, Mexico annually imported about 4,500 tons of plantation rubber from the Far East to supply her growing rubber manufacturing industry. After the fall of the Eastern rubber countries, the industry, which now includes 35 rubber factories, had to depend chiefly on guayule and local wild rubber, and the government decided to develop rubber plantations of its own, especially since experts declared the country eminently suitable for growing *Hevea*. A site near El Palmar, in the State of Santa Cruz, was selected and planted to rubber with seed obtained from *Hevea* plantations owned by the Hule y Latex S. A. Now the government has a plantation with 2,500,000 trees which are at present being grafted with high-yielding material supplied by the United States Department of Agriculture. When mature, the area is expected to yield 12,000 to 15,000 tons of rubber a year.

BRAZIL

A machinery factory and foundry for iron and bronze was recently established in Carusinho, Rio Grande do Sul. Products will include besides machinery for various industries, also apparatus and machinery for the manufacture of rubber goods.

Interest by private parties in collecting and preparing rubber is growing in various states in Brazil. The formation has just been reported of the Empresa Mattogrossense de Borracha, Ltda., to operate plantations and to sheet the rubber produced. The company has bought and also rented rubber lands.

The director of the Empresa Seringalista Amazonense, Ltda., Antonio Braga, has been visiting Benjamin Constant, in the State of Amazonas, with a view to entering negotiations for setting up an establishment for finishing rubber. The company is said to own rubber lands along the banks of the Itecui River.

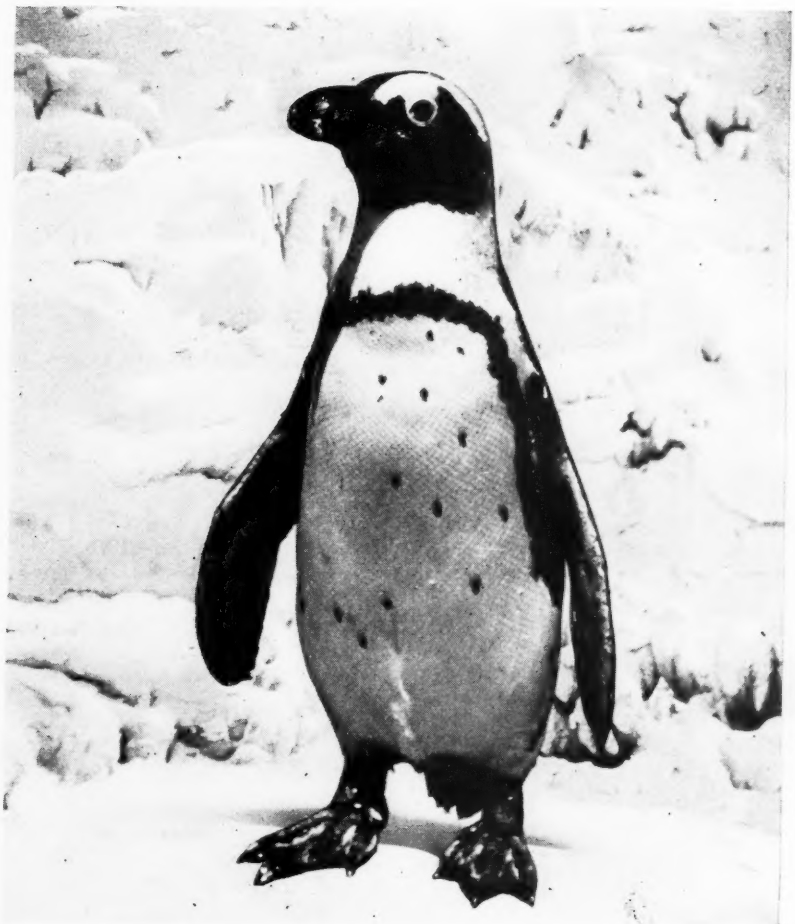
Encouraged by the formation of an organization which will direct and finance rubber production, the State of Paraiba, formerly a producer of mangabeira rubber, is once more preparing to collect this type of rubber.

Recently Virgilio C. Goncalves Ledo, of the Instituto Agronomico do Norte, spent some time in Cuiaba, in the State of Matto Grosso when he demonstrated modern methods of tapping rubber and preparing sheet.

In Brazil's scrap rubber drive which officially ended on July 15 (but is still continuing) school children in Rio alone collected

WHEN PENGUINS SHIVER!...

PERBUNAN



Perbunan remains flexible and holds a tight seal even at Polar temperatures. The entire production of this oil-resistant synthetic rubber is now going into military planes, ships and weapons.

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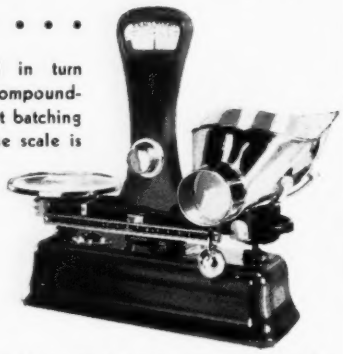

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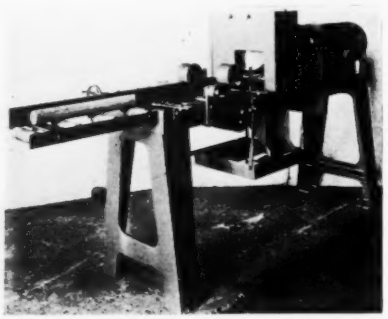

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more than 200 tons; while in Sao Paulo 300 tons more were collected.

Brazil's rubber output for 1943 is expected to be around 35,000 tons, an increase of 100% over last year's amount, but still some 7,000 tons below the country's peak production of 42,510 tons in 1912. With continued expansion of rubber growing and rubber collection, however, it is expected to be able to top these figures in 1944 when it is hoped the rubber yield will be 50,000 to 60,000 tons.

A considerable spur to rubber production was given by President Getulio Vargas when he declared a rubber month not long ago. Several inhabitants of the rubber regions are reported to have formed the plan of establishing rubber workers' cooperatives through which they will buy small plantations and work for their own account.

BOLIVIA

From various Latin American countries come reports of gratifying increases in the output of rubber. According to the Bolivian press, Bolivia produced almost 1,700 metric tons of rubber (1,670 long tons), valued at $1,750,000, in the five months ending February 3, 1943. At this rate it is estimated that the republic will be producing at least 6,000 tons of rubber in 1944. This amount would constitute a record and would be six times the 1941 output. The bulk of the Bolivian rubber is shipped to the U. S.

Official reports from the Bolivian Department of Pandoals show that rubber production is increasing markedly in this region, despite the labor shortage. During the first three months of 1943, 2,000 tons of rubber were shipped.

A local paper, *Ultima Hora*, states that in 1942 Bolivia exported 1,486 tons of rubber, of which 1,153 tons went to the United States, 329 tons to Argentina, and four tons to Brazil.

NICARAGUA

American organizations, cooperating with the Nicaraguan Government, are taking appropriate measures to insure that the more than 3,000 tappers regularly engaged in collecting rubber under the difficult local jungle conditions are receiving proper medical care and food supplies. Thanks to these combined efforts, Nicaragua is rapidly becoming an important source of rubber for the United Nations. According to a report of the Banco Nacional of Nicaragua, the country shipped 2,500,000 pounds of raw rubber to the United States in the past year.

Nicaragua cannot obtain tire recapping and retreading equipment and materials, has no suitable rubber sheet of domestic manufacture available, and facilities for vulcanizing are inadequate. There are only three domestic companies in addition to the Nicaraguan Government Highway Department which are equipped for tire repairing and recapping.

PANAMA

The Inter-American Institute of Agricultural Science, established recently in Costa Rica, will take over from the Goodyear Tire & Rubber Co. its 2,800-acre rubber plantation near Gatun, Panama. This estate, the third largest in the Americas, ranking after the Ford Plantations in Brazil and Goodyear's rubber enterprise in Costa Rica, was started in 1935 to develop strains of disease-resistant rubber trees. About 700 acres are already planted, and the trees will serve to supply rubber growers in Tropical America with material capable of withstanding the destructive South American leaf disease which has hitherto been the main obstacle to the development of rubber plantations in these parts.

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VULPRENES—Solid Modifiers and Substitutes

—for CRUDE, RECLAIMED and SYNTHETIC RUBBER

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VULPRENE SOLUTIONS AND DISPERSIONS. These forms of Vulprene are being used for adhesive tapes, marking paper, water-resistant coatings, etc. *Vulprene Latex* is used as a latex extender particularly as shoe adhesives, for impregnation of paper, can sealing compounds and coating materials. Modifiers for neoprene and Buna S.

ALKYD 18—an alkyd type resin emulsion which is non-yellowing and non-oxidizing. Film is water-white and non-tacky. Preferred where slight oxidizing action may be considered harmful to rubber. Extender for latex and reclaim in coating, combining and impregnating process.

EMULSION 58-8—a series of emulsified elastomers containing up to 65% solids. Recommended for use as full latex replacements in impregnation and combining.

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The Republic of Panama, the United States Department of Agriculture, and the Rubber Development Co. will cooperate in the exploitation of the plantation. The present superintendent, George Slater, will continue to manage it.

Dr. Bressman, director of the Inter-American Institute, is now in Washington in connection with the transfer of the plantations. He appears very optimistic about the future of the rubber industry in the Americas and is reported to have stated that if production could be established with new strains of high-yielding and disease-resistant trees, he believed that the Western Hemisphere would be able to produce natural rubber for as low as 5¢ or 6¢ a pound, costs at which it would be possible to meet a struggle for survival. He felt that the rubber industry was coming back to the Americas to stay.

HONDURAS

A school for rubber gatherers, providing a six-month course of training in the best methods of tapping, preparing, and shipping rubber, has been established by the United States Rubber Development Corp. in Honduras. The modern training is expected to increase rubber outputs in the coming year. In the fiscal year ended June 30, 1943, Honduras exported 25,191 pounds of rubber to the United States.

It is also to be expected that larger outputs of rubber from this country will be obtained in the near future as a result of the action of chicle producers who, it appears, are abandoning this product and turning to rubber instead. A recent cable to the press states that Sheldon Smith Gates, president of Chiclets, New York, N. Y., U. S. A., and Floyd V. Smith, resident manager in Guatemala, have arrived in Tegucigalpa, Honduras, to consult with Ernest G. Holt, of the Rubber Development Corp., about converting their activities from chicle to rubber collecting.

NOTES

The Government of St. Vincent, West Indies, has reduced the British preference tariff on boots and shoes wholly or partly of rubber, except those with leather uppers, from 12½% to 10% ad valorem, and the general tariff from 12½% ad valorem plus 1s. per pair to 10% ad valorem, the same as the British preferential rate.

It is reported that by a decree of July 27 the Argentine Government assumed supervision of eight industrial concerns including six owned by United States companies. Included among the eight are Ford Motor Co., Goodyear Neumatico Sociedad Anonima, Firestone de la Argentina Sociedad Anonima, Michelin Sociedad Anonima Argentina de Neumaticos, and the British-owned Dunlop Pneumatic Tire Co. It is said the action resulted from charges, being investigated, that the firms violated commercial laws that fix maximum prices and require adequate stocks to be maintained. The books of all the companies are to be carefully examined and their inventories scrutinized.

Caracas, Venezuela, has a factory started about two years ago to produce new tires and also to retread and vulcanize worn tires. Altogether it has delivered 50,135 tires, of which 30% was supplied in the past four months.

Production of tires at the factory of the Compania Goodrich Cubana, S.A., is gradually increasing and at present comes to 2,100 units a month. The plant, which operates 24 hours a day, employs 190 persons, including 90 temporary workers.

There was an increase of 11.2% in rubber exports from Ecuador during the first quarter of 1943, as compared with the same quarter of 1942. Most of the rubber in the latter period had been shipped to Argentina, Chile, and Mexico.

But a later report from Ecuador states that in spite of the high prices being paid for rubber, current production has declined as compared with last year. No figures are given, but it is added that rubber exports in April were lower than for April, 1942.

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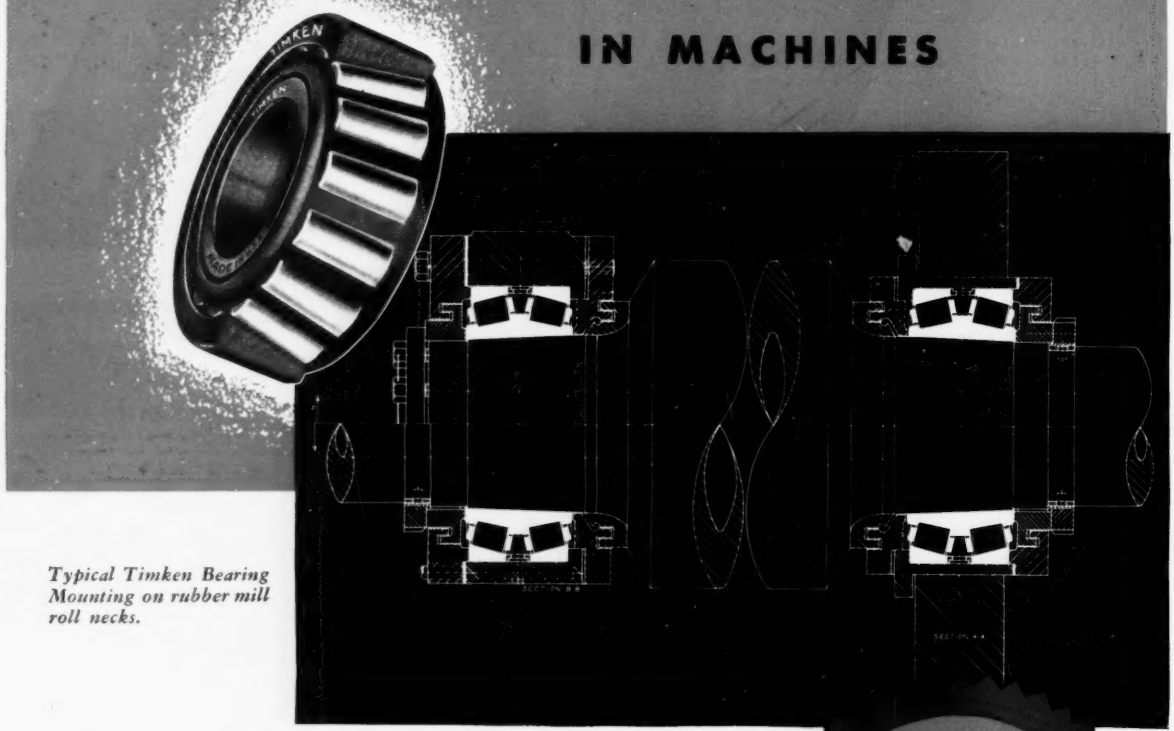

Typical Timken Bearing Mounting on rubber mill roll necks.

The power-saving characteristics of Timken Bearings in rubber mills represent only a small part of their advantages. Rubber machines need the speed-promoting, accuracy-assuring, endurance-building qualities of Timken Tapered Roller Bearings as much as any kind of industrial equipment.

Rubber mills need them on the roll necks for smooth operation, simplified lubrication and extended roll life. When Timken Bearings are used there is no wear on the roll necks, as all movement takes place within the bearings themselves. Thus the necessity for changing rolls due to wear is greatly reduced.

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The more Timken Bearings there are in any piece of rubber-making equipment, the better it will operate, the longer it will last and the less it will cost for operation and maintenance. The Timken Roller Bearing Company, Canton, Ohio.

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TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

FAR EAST

JAPAN

Problems of Over-Supply of Rubber

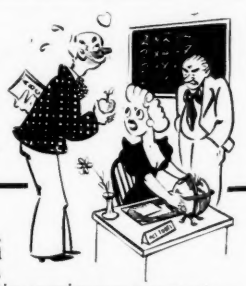
The capture of Malaya and Netherlands India has made Japan master of far more rubber and sugar than she herself can possibly use or can dispose of under present conditions. When she realized her predicament, Japan's first plan was to cut out a large proportion of the rubber and to grow in its place cotton and rice, which she has always had to import in large quantity and of which she seems now to have great need. However it soon became evident that this kind of crop conversion was too difficult and would take too long. A further consideration was the discovery of what huge amounts of capital had been invested in sugar and rubber plantations, and it was decided instead to store surplus outputs until the end of the war when the rich booty would be divided among the Axis partners. Apparently Japan has made an agreement to this effect with Germany and Italy.

But even so, Japan has a perplexing problem on her hands. This is understandable when it is recalled that the rubber lands now under her control were capable of producing more than 1,000,000 tons of rubber annually. Even though outputs have now necessarily decreased, the rubber stocks must be accumulating at a fantastic rate. Certainly storage of the vast amounts of rubber must present many difficulties.

In the Dutch East Indies the Japs are said to have drastically curtailed rubber production on European- and American-owned estates; native rubber growers have been ordered to slow down. Over a large part of the former Dutch possessions this order is not hard to enforce since in many cases rubber growing is a sideline with the natives, as food crops are of first importance. But in some of the most productive rubber areas the native has come to depend heavily on his rubber crop, and here the Japanese cannot enforce reduction of outputs too rigorously for fear of further provoking the already strong local feeling against them. They already have a serious situation to face caused by the mass migration of unemployed rubber estate coolies to cities.

To use up some of the excess rubber, the Japanese are seeking new applications for it. Mention has already been made of attempts to manufacture motor fuel from rubber locally. Judging from statements in the Dutch Nazi daily *Nieuwe Rotterdamsche Courant*, these efforts have been successful, and oil suitable for airplanes has been developed and is now in use.

GOING TO SCHOOL AGAIN?



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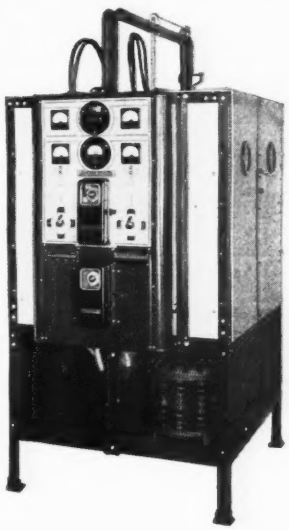

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Rubber is also being used to replace leather for footwear, and Japanese laborers on railroads, in mines, and in the chemical industry, and also men in the Japanese marines and police services will get rubber shoes.

Various reports emanating from the Far East mention the manufacture of boats from rubber. According to one version, a large freighter entirely of rubber is under construction in Java and is soon to sail to Japan, laden with raw materials. Another story will have it that large all-rubber tow-boats are being built. The boats have no motors and are to be towed by ordinary powered vessels; the tow-boats are to carry needed products to Japan and on arrival at their destinations will be dismantled, and the rubber used to manufacture a variety of rubber goods.

But despite all efforts at curbing outputs and using as much rubber as possible, the Japanese say that they expect a surplus of more than 1,000,000 tons will be available at the end of the war to be divided among the Axis nations and to supply all Europe and Africa.

New Fiber for Tire Fabric

Japan may have an excess of rubber, but she still is short of cotton. To make up this deficiency she has been experimenting with other fibers including those obtained from the leaves of pineapple plants. It is claimed that this fiber is suitable for fabric for bicycle tires as well as for hose, belting and fishing nets.

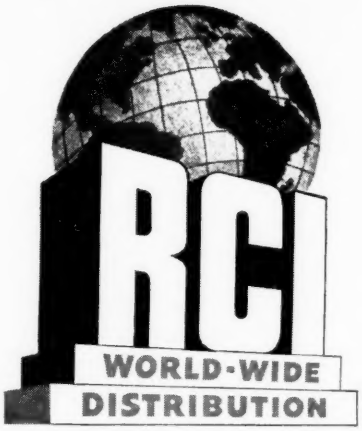
Siam Rewarded

If the Tokio radio broadcasts are to be relied upon, Japan intends to cede to Siam the four Malayan states formerly known as the Unfederated Malay States: namely, Perlis, Kedah, Kelantan, and Trengganu. These states were under the slack and uninterested control of Siam up to 1909, when they came under British dominion. Rubber is grown more or less extensively in all of these states. According to prewar statistics, Kedah had 324,000 acres under rubber, Kelantan about 95,000 acres, Trengganu 45,000 acres, and Perlis only about 5,000 acres.

CEYLON

Insufficient cooperation by some estate owners and a slow-down among tapping coolies are said to be the main factors that threaten to nullify efforts at increasing Ceylon's rubber output this year. To raise rubber outputs here, producers had undertaken to substitute on 80% of their trees a more drastic tapping method than usually followed; while, in addition, they would practice slaughter tapping on the remaining 20%. Considerable delay occurred, however, in putting these newer and more stringent methods into effect because planters on the whole were unwilling to run the certain risk of ruining part of their estates without a prospect of adequate compensation by the government, and it took some time for government to appreciate the viewpoint of the planters and make it worth their while to cooperate. But it seems that some planters are still not satisfied and are agitating for a price of one rupee a pound (about 30 cents); a few have even suggested 1.50 rupees per pound.

On the other hand the labor situation is causing difficulties. There is claimed by some to be a shortage of tappers, and the Ceylon Government tried—without success—to obtain 25,000 tappers from India. Many in Ceylon say that there is no need of importing additional labor and actually enough labor is on hand here, but that unfortunately the "dearness allowance" which the government has been granting labor to meet the higher cost of living is having an unexpectedly deleterious effect on working habits. The coolie's wants are few, and it is shown that the grants permit him easily to satisfy his wants by working 15 days a month instead of 24 days as he had hitherto been accustomed to doing. The result as regards output is obvious. It has been suggested that in view of the urgency of the times and the vexing reaction of the coolie to the "dearness grant," the best solution would be to conscript labor for rubber estates.



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Nature too seems to have been unfavorable to the expansion of outputs. Thus throughout the Kandy district rubber planters report one of the most serious outbreaks of *Oidium* experienced in years. This disease attacks the young leaves of the trees, often affecting yields.

The outlook for any considerable increase in the amount of rubber to be obtained from Ceylon this year as compared with last year, is obviously not favorable. The best that it seems may be expected is that the current year's output will not fall below that of last year; exact figures of production in 1942 do not appear to be available as yet, but it seems to have been about 120,000 tons.

In Advisory Circular No. 20, the Rubber Research Scheme of Ceylon, lists the planting material recommended for use in 1943. Among the proved clones recommended for use on a large scale are two Ceylon clones, Wagga 6278 and Millakande 3/2, although it is added that for the present they should be planted only in wet lowland districts. The well-known Netherland Indies clones, Tjirandji 1 and 16, and the Malayan clone, Glenshiel 1, may also be planted on a large scale. Clone BD 5, which is probably the oldest of all, and stems from Java, no longer figures on the list of recommended clones. The yields are satisfactory, although below those of the other well-known clones; but the bark shows a tendency to burst, and also is susceptible to disease.

Planters are advised to try out new, unproved clones and seedling families on small areas of their land wherever possible to aid in accelerating the selection of new material.

NEW ZEALAND

With the establishment of a new tire retreading company in Wellington during May, New Zealand's capacity is said to have been raised to 100,000 treads a year. For retreading, New Zealand will use 500 long tons of old and waste rubber and 20 long tons of new rubber; the renovated tires are expected to give not less than 6,000 miles.

EUROPEAN NOTES

On August 11, about six weeks after they had severely damaged the big factory at Huels in the Ruhr, where a large part of the Nazis' synthetic rubber is produced, Flying Fortresses blasted two large factories in Hanover, the Nordhaven plant on the south bank of the Weser-Elbe Canal, and the Vehrenwalder Straffa works in Hanover itself. Together they employed 50,000 persons, and it is believed that they supplied a considerable part of the rubber tires required by both the German Army and Air Force.

Another target of R. A. F. attacks on August 11 was the big I. G. Farbenindustrie chemical plant at Ludwigshafen. These works, which stretch three miles along the west bank of the Rhine, produce plastics, dyes, sulphuric acid, oils and synthetic ammonia.

The Germans have been experimenting with the production of locally grown rubber in Poland. The General Government of Poland reports that the *Asclepias* plant has been tested and results have been sufficiently favorable to decide the government to plant *Asclepias* exclusively. Initial outputs, it is claimed, were 1400 kilograms of fiber and 100 kilograms of rubber.

Recent British raiders over the Italian area chose, among other objectives, the Pirelli rubber and plastics works at Milan, which are reported to have been damaged.

The manufacture of synthetic rubber and elastic products is to be undertaken by a new Swiss company, Gebanit A.G., Buehler, Appenzell, it is learned.

From Rumania also come reports of efforts to develop domestic sources of raw rubber. The Ministry of Agriculture apparently plans large-scale experiments in Bessarabia and Bukovina since local peasants have been ordered to cultivate 5000 hectares. While it is known that the necessary seed has already been distributed, there is no indication as to what plants it is intended to try out.

Editor's Book Table

BOOK REVIEWS

"Micromeritics. The Technology of Fine Particles." J. M. DallaValle. Published by the Pitman Publishing Corp., New York, N. Y. Cloth, 6 by 9 inches. 442 pages. Index. Price $8.50.

This book brings together a mass of widely scattered information on methods of particle measurement, size distributions, packing arrangements, and a general theory concerning the physical properties of finely divided substances. Only particles within a definite range of size, ranging from 10^{-1} to 10^{5} microns are treated. The range is quite wide, however, covering particles of colloidal dimensions up to those an inch in diameter. It is pointed out that no set procedure for measuring aggregates of particles has ever been developed and no matter what method is used, the characteristics and behavior of small particles can be understood satisfactorily only when the methods of determining size distribution are placed on a firm basis. In addition to the value of a knowledge of the science of small particles in soil physics, mineral physics, chemical engineering, geology, and hydrology, the behavior and characteristics of small particles are important in pigment grinding, industrial hygiene, foods, and in many other industries.

Following the introduction, the fundamental technology of fine particles is discussed in chapters on the "Dynamics of Small Particles," "Shape and Size Distribution of Particles," "Methods of Particle-Size Measurement," and the "Theory of Sieving and Grading of Materials." Other chapters follow on the "Characteristics of Packings," "Electrical, Optical and Sonic Properties," "Thermodynamics of Particles," and "Chemical Properties of Small Particles." Of particular interest should be the chapter on the "Determination of Particle Surface and the Theory of Fine Grinding." The latter chapter reviews information on ball-mill grinding both dry and wet. The last two chapters, "Collection and Separation of Particulate Matter from Air" and "Atmospheric and Industrial Dust," are of interest to almost any industrial engineer.

The book contains an extensive bibliography and a listing of useful constants and conversion factors in the appendix.

"Practical Emulsions. A Handbook of Emulsions, Emulsifiers, and Methods of Formulating and Making Emulsions of Practical Value in Industry." H. Bennett. Published by Chemical Publishing Co., Inc., Brooklyn, N. Y. 1943. Cloth 5½ x 8½ inches. 462 pages. Indexed. Price $5.

This book deals specifically with emulsions for the practical worker, with only a brief treatment of the theories of emulsions since it is pointed out that there are many excellent books which deal with emulsions in a theoretical and general manner. The writer, an authority in the field, has included data and methods from his own broad experience along with selected references from the works of other specialists. The correlation of known information and the inclusion of hitherto unpublished material should be useful, even to the experienced worker.

A discussion of emulsifying agents and types of emulsions and foams is given in the first part of the book, followed by a chapter on methods, formulation, and equipment, and chapters on stability and general technical emulsions. In the latter the various types of emulsions, such as asphalt, cosmetic, detergent, food, latex, wax, polish, etc., are covered. The difference between dispersing agents and wetting agents is explained in a chapter on these materials, and of considerable value is the listing of dispersing agents, emulsifying agents, emulsions, and demulsifying and defoaming agents, all of which are complete with literature and patent references and which conclude Part I of the book.

In Part II are found hundreds of formulas and their methods of preparation in the fields of agricultural spray emulsions, cutting oils, gasoline emulsions, lacquer emulsions, lubricant emulsions, paper processing emulsions, resin and rubber emulsions, waterproofing emulsions, dispersions, and many others.

The book should be successful in its expressed purpose of providing the proper understanding of the technique and formulation

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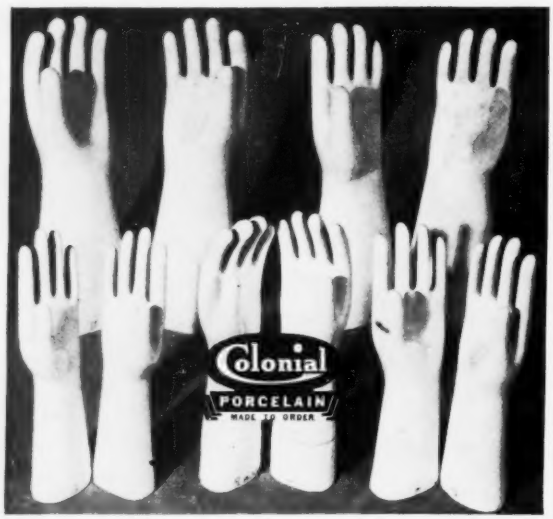

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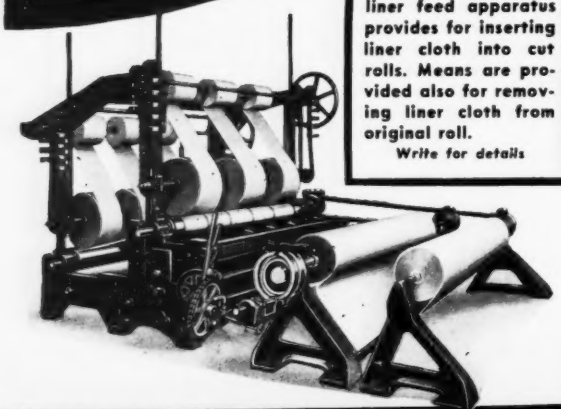

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necessary to produce a good emulsion and to make readily available practical information to technical workers in this field.

"A.S.T.M. Standards on Plastics." Prepared by A.S.T.M. Committee D-20 on Plastics and D-9 on Electrical Insulating Materials. Published by the American Society for Testing Materials, 260 S. Broad St., Philadelphia, Pa. May, 1943. Paper, 6 by 9 inches. 375 pages. Price $2.

The first edition of this new A.S.T.M. publication on plastics was prepared by Committee D-20 on Plastics and Committee D-9 on Electrical Insulating Materials with some assistance from other groups including Committee D-11 on Rubber Products. The book contains 71 specifications, methods of tests, and definitions on plastic materials, of which more than 20 items were developed as a result of work of Committee D-9 in the field of electrical insulation materials.

Standard specifications on the following materials are covered: several kinds of molding compounds—phenolic, polystyrene, melamine formaldehyde, urea formaldehyde, cellulose acetate, cellulose acetate butyrate; also sheets, rods, etc. of cellulose nitrate, and cast methacrylate. Included also are specifications for vinyl chloride-acetate resin sheets, phenolic laminated sheets and phenolic laminated tubing for radio applications.

Standard test procedures essential in determining the various properties of plastics cover such matters as: arc resistance, chemical resistance, color fastness, compressive strength, deformation, dielectric constant, flammability, flexural strength, flow temperatures, haze, impact resistance, refractive index, shrinkage, softening point, tensile properties, tear resistance, thermal conductivities, water absorption, etc.

A descriptive nomenclature is included, and there are various sets of definitions of terms of interest in the plastics field.

NEW PUBLICATIONS

"The Family of Monsanto Plastics. A Guide for Product Designers." Monsanto Chemical Co., Plastics Division, Springfield, Mass. 20 pages. This illustrated booklet has much information both for the complete stranger to plastics in describing what they are, how they are used and what they may be expected to accomplish in the future, and also presents many technical facts for the postwar product designer. There are pages of tables of comparative properties of the six Monsanto plastics, and then pages devoted to each type in which are described molding compounds, outstanding properties, uses, design opportunities; included also is a table showing in some detail the range of properties of each plastic. The processing of these plastics: compression molding, injecting molding, extrusion, laminating, fluid pressure molding, and pulp molding are explained and illustrated in an effective manner.

"Galex, GR-S Plasticizer." Technical Service Bulletin. Thiokol Corp., Trenton, N. J. 15 pages. The properties and behavior of Galex, a non-oxidizing resin plasticizer, in GR-S in comparison with two standard coal-tar softeners are given in this bulletin. The study also includes stocks containing as high as 40 parts of Galex on 100 parts of GR-S which show good tensile strength, high elongation, and good friction characteristics. It is stated that a considerable number of plasticizers were tested, and of these Galex imparted the greatest tack to GR-S compounds. Stocks containing 20 parts of Galex are shown to have tensiles of 2900 psi. and elongations of 600% and to extrude and calender well. Flex cut growth resistance, as measured by the De Mattia flexing machine, is greatly improved in GR-S compounds by the addition of Galex. Aged in hot air, Galex compounds show no reduction in tensile strength and little reduction in elongation, while other properties are well preserved. Good tear resistance, which is maintained extremely well after hot air aging, is also reported. Test results are given in tables and also illustrated by means of graphs.

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"Carbon Black in GR-S." H. E. Simmons, Office of the Rubber Director, Washington, D. C. 44 pages. This bulletin represents a summary of a report of more than 350 pages entitled "A Survey Study of Carbon Blacks in GR-S," prepared by B. S. Garvey, Jr., and J. A. Freese, Jr., of The B. F. Goodrich Co., Akron, O., and given limited distribution in March, 1943. The Educational Committee of the Office of the Rubber Director with the advice and detailed help of the authors has prepared this new bulletin in order that the rubber industry as a whole might have the benefit of this comprehensive piece of laboratory work. Garvey and Freese have classified the various carbon blacks into groups according to approximate particle size and method of production, and the blacks are designated wherever possible in accordance with the recommendations of the Carbon Black Nomenclature Committee. Details of the experimental procedure for the determination of plasticity, tubing index, tensile, heat build up, rebound, high temperature tear resistance, hardness, and abrasion resistance are first given, after which the treatment of data, selection of cure for tensile properties, and a summary of results are stated. Included in the summary of results is a table of loading ranges for best processing properties for eight types of black and also a discussion of loading ranges for tensile and elongation. The main body of the bulletin contains bar graphs showing the effect on the above mentioned physical properties of eight types of black in loadings from 20 to 75 PHR and line graphs for six loadings of each of the same eight types of black. The bulletin is concluded with photographs of carbon black types *versus* extrusion properties.

"The Improvement in Thermal Shortening and Fatigue (Cut Growth) of GR-S Treads." Columbian Carbon Co., 41 E. 42nd St., New York, N. Y. May, 1943. 36 pages. A new compounding approach to the problem of improving the resistance of GR-S treads to cut growth based on the use of large amounts of carbon blacks of particle sizes that reach or exceed the fineness or state of subdivision of the polymer units in conjunction with large amounts of solvent plasticizers to increase the particle size of the polymer units is described in this bulletin. The theory was developed from the fact that electron microscope studies had revealed that typical GR-S latex had polymer units much smaller than the units of natural rubber latex and were of the order of 50 mμ, which would then require carbon blacks with a particle size in about this same range in order for adequate reenforcement to be obtained. Since the use of large amounts of super-fine carbon blacks produces stocks of high hysteresis, the enlargement of the size of the polymer units at the same time by the use of large amounts of solvent plasticizers appeared to be the next step required.

The bulletin reviews factors previously reported affecting flex-crack growth in the first section on fatigue and then describes the use of the company's "Hot Iron" test under the section on heat tenderness. Reenforcement theory and polymer surface are discussed in the next two sections, after which results obtained with increased softener in high Micronex-high softener combinations are given and explained. A further development in which Statex and a coal-tar softener are used is described under a section on cooler treads for heavy-duty service. All results are then summarized and illustrated by means of charts showing the properties of the new compounds in comparison with natural rubber tread stocks and with each other.

"How to Take Care of Sectional Airbags." The Rubber Manufacturers Association, Inc., 444 Madison Ave., New York, N. Y. 2 pages. Simple precautions for tire repairmen that will increase the number of cures per bag they may be able to obtain are given in this bulletin in the interest of rubber conservation. It is pointed out that the same general procedure also applies to curing tubes.

"Carbon Black Nomenclature." Bulletin No. 128. Binney & Smith Co., 41 E. 42nd St., New York, N. Y. 2 pages. The recently published Carbon Black Nomenclature decided upon by the Office of the Rubber Director together with the corresponding Binney & Smith types is given in this bulletin. A résumé of the use of the company's various grades of carbon black in compounding GR-S with some elaboration on the meanings of the various classifications is included.

"Piccoumaron. Para-Coumarone Indene Resins." Pennsylvania Industrial Chemical Corp., Clairton, Pa. 6 pages. This folder gives general information on para-coumarone-indene types of resins, produced by the polymerization of the unsaturates occurring in coal-tar light oil and allied sources of raw materials. These resins have many uses in natural and synthetic soft and hard rubbers as well as in paints, varnishes, and flooring. A table of grades according to melting point and color is given, and it is mentioned that special grades are made for those companies whose use is sufficiently large to warrant them. The resins may also be obtained in the form of solutions. The physical and chemical properties of these thermoplastic resins are discussed, and their solubility, defined as whether or not 40 parts by weight of resin will remain in 60 parts by weight of the solvent at ordinary temperatures, is given. The most suitable plasticizers are mentioned and the compatibilities of these resins with other resins, gums, rubbers, and pitches are covered.

"Suprex Clay in Buna S. Its Effect on Rate of Cut Growth." Bulletin No. 2. J. M. Huber, Inc., 460 W. 34th St., New York, N. Y. 8 pages. A report on the beneficial effects of Suprex Clay and magnesium carbonate in reducing cut growth in GR-S tread compounds is given in this bulletin. Results are shown for three compounds containing Suprex Clay in varying amounts, for one compound containing soft clay, and for a control compound containing no clay. Samples were tested both before and after Geer aging on a du Pont flexing machine, according to the method described by Carlton and Reinbold in the May, 1943, issue of INDIA RUBBER WORLD. The addition of from 7.5 to 10 parts of Suprex Clay to a GR-S tread compound was shown to produce a remarkable improvement in resistance to cut growth. Of the 18 other pigments studied, magnesium carbonate was the only one found to be in the same range of effectiveness as Suprex Clay in developing resistance to cut growth. A GR-S tread compound containing Suprex Clay approached the cut growth resistance of a natural rubber tread compound before heat aging, although it was somewhat inferior after aging.

"Extender 600. Plasticizer and Extender for Synthetic and Reclaim Rubbers." Standard Chemical Co., Akron Savings & Loan Bldg., Akron, O. 8 pages. The uses of Extender 600, a special modified vegetable oil copolymer, developed especially as a plasticizer and extender for Buna S, Buna N, Natural, and reclaimed rubbers are explained in this bulletin. Typical test recipes containing this extender in the two Buna rubbers and some physical test results are given. Information on its use with reclaimed rubber is also included.

"Selenac in GR-S Compounds." R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y. 8 pages. This bulletin shows by means of tables and graphs how sulphurless GR-S Selenac compounds (1) have greater elongation than similar compounds cured with sulphur, (2) retain their elongation at elevated temperatures better than similar sulphur-cured compounds, and (3) maintain their physical properties after heat aging better than similar sulphur-cured compounds. In addition there are given, together with test data both aged and unaged, suggested stocks of this type for inner tubes, mechanical goods, and a GR-S stock with building tack.

"Molding Polyvinyl Alcohol (PVA)." Electrochemicals Department, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. Technical Data Bulletin No. 3-243. 5 pages. The commercial grades of partially and completely hydrolyzed types of polyvinyl alcohol and a discussion of the proper plasticizers for use in manufacturing molded products are described in this bulletin. By varying the grade of PVA and the type and amount of plasticizer, it is possible to prepare a wide range of compositions suitable for molding or extrusion in conventional rubber and plastics equipment. These resins are unaffected by oils, fats, greases, and other common organic solvents such as alcohols, esters, ethers, ketones, and both aliphatic and aromatic hydrocarbons. But they are not recommended where a high degree of water resistance is required. The bulletin also includes discussions on the preparation of molding compositions, compression molding, and physiological properties and graphs showing the variation in hardness of PVA moldings with different plasticizers.

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"The Elasticity of a Network of Long-Chain Molecules. I." L. R. G. Treloar. The British Rubber Producers' Research Association, 19 Fenchurch St., London, E.C.3, England. Publication No. 30. 8 pages. The treatment of the elasticity of a molecular network by the method of Wall is discussed and compared with the earlier treatment of Kuhn. It is shown that a more accurate application of Kuhn's method leads to formula for elongation and shear in agreement with those of Wall.

"Cotton Production in the United States. Crop of 1942." United States Department of Commerce, Bureau of the Census, Washington, D. C. 38 pages. **"US Batteries for Transportation Maintenance.** Truck Battery Guide." United States Rubber Co., 1230 Sixth Ave., New York, N. Y. 28 pages. **"Report on Progress of the WPA Program."** Works Project Administration, Washington, D. C. 90 pages. **"A Primer on Goodyear Tires."** Goodyear Tire & Rubber Co., Akron, O. 16 pages. **"How to Save Truck Tires."** Dominion Rubber Co., Ltd., Montreal, P. Q., Canada. 24 pages. **"Industrial Fire Brigades. A Training Manual."** National Fire Protection Association, 60 Batterymarch St., Boston, Mass. 184 pages. **"Employment—The Foundation of All Social Security."** Dominion Engineering Works, Ltd., Montreal, P. Q., Canada. 32 pages. **"CMP Procedure Spelled Out Once Again."** National Association of Purchasing Agents, 11 Park Place, New York, N. Y. 15 pages.

RUBBER BIBLIOGRAPHY

War Procurement of Natural Rubber. E. G. Holt, *Foreign Commerce Weekly*, July 31, 1943, pp. 3-5.

Tensiometer Stiffness Test for Elastomers At Low Temperatures. B. K. Green, R. G. Chollar, and G. J. Wilson, *Rubber Age (N. Y.)*, July, 1943, pp. 319-27.

Some Observations on the Flex-Cracking Characteristics of GR-S (Buna S) Compounds. J. Breckley, *Rubber Age (N. Y.)*, July, 1943, pp. 331-34.

Tires Can Take It. *Du Pont Magazine*, June-July, 1943, p. 6.

Rubber, Polyisoprenes, and Allied Compounds. II. The Molecule-Linking Capacity of Free Radicals and Its Bearing on the Mechanism of Vulcanization and Photo-Gelling Reactions. E. H. Farmer and S. E. Michael, *Rubber Chem. Tech.*, July, 1943, pp. 467-78.

Statistical Lengths of Rubber-Like Hydrocarbon Molecules. F. T. Wall, *Rubber Chem. Tech.*, July, 1943, pp. 479-85.

Crystal Structure of β-Isoprene Sulphone. E. G. Cox and G. A. Jeffrey, *Rubber Chem. Tech.*, July, 1943, pp. 486-92.

Molecular Weights and Intrinsic Viscosities of Polyisobutylenes. P. J. Flory, *Rubber Chem. Tech.*, July, 1943, pp. 493-508.

Phosphatides of Hevea Brasiliensis. G. R. Tristram, *Rubber Chem. Tech.*, July, 1943, pp. 536-41.

Electrophoretic Study of the Proteins in Rubber Latex Serum. C. P. Roe and R. H. Ewart, *Rubber Chem. Tech.*, July, 1943, pp. 542-49.

Resilient Energy. E. C. B. Bott, *Rubber Chem. Tech.*, July, 1943, pp. 591-608.

Brittle Temperature of Rubber under Variable Stress. A. R. Kemp, F. S. Malm, and G. G. Winspear, *Rubber Chem. Tech.*, July, 1943, pp. 609-17.

X-Ray Studies of Reactions Involving Accelerators. Orientation of Crystalline Phases on Stretching of Rubber Stocks. G. L. Clark, R. L. LeTourneau, and J. M. Ball, *Rubber Chem. Tech.*, July, 1943, pp. 621-33.

Synthetic Rubber. A Spectroscopic Method for Analysis and Control. R. B. Barnes, U. Liddell, and V. Z. Williams, *Rubber Chem. Tech.*, July, 1943, pp. 634-49.

Direct Determination of Rubber Hydrocarbon. Chromic Acid Oxidation Method. V. L. Burger, W. E. Donaldson, and J. A. Baty, *Rubber Chem. Tech.*, July, 1943, pp. 660-67.

Digest of Cooperative Test Program on Accelerated Light Aging of Rubber. J. H. Ingmanson, *Rubber Chem. Tech.*, July, 1943, pp. 668-74.

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APPLICATION

United States

2,323,962. Sanding and Buffing Tool Including a Rotatable Drum Having Flanged Ends and a Hollow Rubber Cylinder Coextensive with the Drum Length and Overlying the Flanged Ends; the Cyinder Has Inwardly Extending Rubber Flanges Forming Cylindrical Portions for Gripping and Making an Airtight Seal with the Drum Ends. R. G. Ames, assignor of one-half to G. W. Williams, both of Burlingame, Calif.

2,323,975. Trimming Machine Having a Fixed Blade with a Beveled Front Face to Be Engaged by a Molded Rubber Body. R. R. Campbell, Lynn, Mass., assignor to United Shoe Machinery Corp., Flemington, N. J.

2,324,201. Sling-Shot Including a Forked Handle, a Doubled Elastic Strip Secured at Its Ends to the Upper Ends of the Prongs of the Handle and Provided Midway Its Length and at the Side Facing toward the Handle with a Forwardly Projecting Boss of Soft Rubber. W. G. Donaldson, Independence, Mo.

2,324,226. Hand Grip Cover for Flatirons Including a Corrugated Rubber Body Closed except for an Opening along the Bottom, Thus Adapting the Cover to Be Forced over the Handle to Grip It at the Closed Ends. B. J. Murphy, St. Paul, Minn.

2,324,253. Vacuum Bottle Including a Casing, a Container of Fragile Material within the Casing, the Container Having a Hemispherical Bottom and Cushioning Means between the Vessel Bottom and the Bottom of the Casing Comprising a Cylindrical Rubber Ring Generated by a Rhomboid Having Its Upper Acute Vertex Located Inwardly toward the Generating Axis of the Ring. O. M. Anderson, New Britain, Conn., assignor to Landers, Frary & Clark, New Britain, Conn.

2,324,277. Playing Ball Including a Hollow Tightly Inflated Sphere of Flexible Vulcanized Rubber or the Like; the Walls of the Sphere Have Irregular Design Features Projecting therefrom. T. W. Casey, Fairlawn, and A. E. Sidnell, Akron, assignors to Seiberling Latex Products Co., Barberton, all in O.

2,324,365. Windshield Swipe Formed from a Blank of Resilient Sheet Metal Folded Longitudinally to Provide a Bridge and Sidewalls Extending from Opposite Sides of the Bridge and Constituting Blades with Rubber Shoes Mounted thereon in Covering Relation to Free Edge Portions. E. Coutts, Penryn, Calif.

2,324,591. Rubber Boot or Shoe Including a Flexible Laminated Sole and a Plurality of Flexible Plate-Like Members. C. E. Olsen, Bridgeport, Conn.

2,324,863. Bearing Structure for Marine or Similar Propeller Shafts Including a Housing with a Bearing of Rubber or Like Material. J. S. Merchant, Cuyahoga Falls, O.

2,324,974. Inner Tube for Pneumatic Tires Including Annular Wall Portions of Liquid Rubber Latex and a Valve Stem of the Same Material Cast Integrally with a Portion of the Tube Wall. H. W. Greenup, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,976. Bicycle Seat or the Like Including a Base Member Having an Edge Portion Extending Downwardly from the Main Seating Portion thereof and a Sponge Rubber Seat Cushion Molded to Conform to the Base Member. G. V. Soper, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,979. In a Brake Construction, a Torque Receiving Member, a Plurality of Outwardly Open Cups Carried by That Member at the Outer Periphery, a Metal Sealing Disk Positioned in Each of the Cups, and a Rubber Sealing Member Vulcanized to the Inner Face of Each of the Metal Sealing Disks. J. W. Hatch, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,983. Light Buoy Including a Pneumatic Tire Positioned around a Hollow Cylindrical Metal Container and an Inflatable Rubber Member in the Tire to Enable the Buoy to Float. A. H. Gollings, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,989. Elastic Novelty Yarn Including an Elastic Thread and a Core Thread Wrapped around the Latter to Form a Unit Which Lies along the Axis of the Novelty Yarn When It Is Tensioned. S. W. Alderfer, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,994. Pneumatic Tire and Rim Assembly Having a Bead Locking Device Including an Inextensible Endless Band with a Plurality of Rigid Wedge-Shaped Tire Bead Clamping Units. J. E. Hale, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,996. Pneumatic Tires Having a Transversely Arcuate Body Portion and a Tread with Integral Outwardly Extending Traction Elements Adapted to Provide Traction in a Deformable Medium. W. S. Coben, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,325,123. Liquid Spray Device Having a Bell-Shaped Head Formed of Rubber or Similar Material with a Small Perforation in the Crown of the Head. S. Isenberg, Chicago, Ill.

2,325,132. Protector for a Rotary Drill Stem Including a Pair of Hollow Structures Arranged One without the Other and a Circumferentially Discontinuous Sleeve Secured within the Outer Structure and a Body of Resilient Rubber-Like Material Mounted between Sleeve and Inner Structure and Secured to Both and Comprising the Sole Connecting Means therebetween. F. L. Haushalter, Akron, O., and L. L. Horchitz, Los Angeles, Calif., assignors to B. F. Goodrich Co., New York, N. Y.

2,325,330. Rubber Glove Including a Body Portion and an Encircling Band of Thicker Rubber Applied thereto. R. S. Lewis, assignor to Pioneer Rubber Co., both of Willard, O.

2,325,354. Puncture-Sealing Inner Tube of Flexible and Resilient Vulcanized Rubber Composition Having a Tread Portion Formed with External Ridges and Valleys and with Interior Grooves and Arches Respectively; a Solid Mass of Rubber Is between the Imaginary Surfaces Which Are Tangent to the Bottom of the Outer Valleys and the Internal Grooves Respectively. E. T. Wyman, Brookline, Mass.

2,325,414. Floor Covering Which Comprises a Lower Layer of Insulating Rubber, an Upper Layer of Conductive Rubber and a Metallic Conductor Extending throughout the Area of, and Wholly Embedded in, the Upper Conductive Layer. C. S. McChesney, Kenmore, and J. W. Short, assignors to Dunlop Tire & Rubber Corp., both of Buffalo, all in N. Y.

PROCESS

United States

2,324,644. Vulcanizing Rubber by Applying External Heat to Electrically Conductive Unvulcanized Rubber and Passing an Electric Current through the Rubber. E. F. Powell, S. Coldfield, D. Bulgin, and P. W. Badham, all of Erdington, Birmingham, England, assignors to Dunlop Tire & Rubber Corp., Buffalo, N. Y.

2,324,735. Forming a Dipped Latex Article by Alternately Dipping a Suitable Form into Unfoamed Liquid Latex and into Liquid Latex Foam. A. N. Spanel, New York, N. Y.

2,324,889. Making a Cushion Heel by Providing a Celluloid Top Plate and a Rubber Heel Body of Substantially the Same Plan Shape, Softening the Top Plate with Celluloid Solvent and Then Securing the Top Plate to the Upper Surface of the Heel Body with Cement. J. Susskind, Brookline, assignor of one-half to H. Freedman, Boston, both in Mass.

2,324,975. Making Rubber Strips from Latex by Compounding Sulphur-Free Latex with a Delayed-Action Accelerator Capable of Releasing Sulphur upon Prolonged Heating and Forming a Continuous Dried Rubber Strip from the Latex Compound, Progressively Stretching the Dried Rubber Strip Almost to the Breaking Point. S. W. Alderfer, Fairlawn, and H. W. Greenup, assignors to Firestone Tire & Rubber Co., both of Akron, all in O.

2,324,978. Molding Portable Reenforced Plastic Articles by Supporting a Reenforcing Member in a Mold Cavity in Spaced Relation to the Wall thereof. W. O. Lohrand, Barberton, and C. H. Whitlock, assignors to Firestone Tire & Rubber Co., both of Akron, all in O.

2,324,980. Reclaiming Synthetic Rubber by Heating together a Mixture of Rosin, Asphalt Residue from Cracking Crude Petroleum, Solvent Naphtha, and a Vulcanized Polymer of 2-Cloro-1,3-Butadiene for Less Than Two Hours at a Temperature above 212° F. F. L. Kilbourne, Jr., Copley, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,324,995. Forming a Compact Rubber Bale by Stacking a Plurality of Rubber Sheets upon a V-Shaped Ram Head within an Open Compression Chamber through an Open Door, Closing and Locking the Door, Whereby the Compression Chamber Is Converted into a Tightly Closed Chamber, Forcing the Ram Head toward a V-Shaped Die Block and Compressing the Rubber between the Head and Block, Thus Making the Rubber Flow into a Compact Bale, and Completing the Cycle of the Operation by Moving the Ram Head away from the Die Block, Unlocking the Door, and Removing the Formed Bale of Rubber through the Door. R. W. Allen and W. T. Runals, assignors to Firestone Tire & Rubber Co., all of Akron, O.

2,325,152. Preserving Rubber by Treating It with an Alkylated Resorcinol Wherein the Alkyl Group Contains More Than Three, but Less Than Six Carbon Atoms. R. L. Sibley, Nitro, W. Va., assignor to Monsanto Chemical Co., St. Louis, Mo.

2,325,385. Method of Impregnating an Absorbent Material with a Rubber Derived from an Aqueous Latex Where the Absorbent Material Is Passed through a Bath of Latex and Removes a Portion thereof, Maintaining in the Bath a Substantially Uniform Ratio of Rubber Solids to Non-Rubber Solids by the Addition to the Bath of Latex Serum as the Impregnation Progresses. E. K. Fischer, Long Island City, assignor to Interchemical Corp., New York, both in N. Y.

2,325,289. Reclaiming Rubber Waste by Treating a Mixture Consisting Substantially of the Ground Rubber Waste and about 1-5% of a Substance Selected from the Group Consisting of Abietic Acid and Sylvic Acid in the Absence of Water or Steam for about Approximately 30 Minutes While Maintaining a Temperature of between 100 to 140° C. A. Treves, assignor, by mesne assignments, to Rubber & Plastics Compound Co., Inc., both in New York, N. Y.

United Kingdom

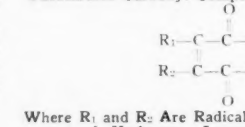
553,733. Polymeric Materials. E. I. du Pont de Nemours & Co., Inc.

554,069. Producing Molding Compositions and Molded Articles therefrom. American Cyanamid Co.

CHEMICAL

United States

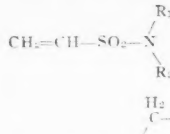
2,324,739. Coated Metallic Article, the Coating of Which Includes an Acid-Reacting Vinyl Resin Heat-Treated in Place with a Higher Polyalkylene Glycol to Produce a Hard, Flexible, Tough, and Adherent Coating; the Hydroxyl Groups in the Polyalkylene Glycol Are Separated by at Least Three Alkylene Radicals Joined by Oxygen Atoms, and the Acid Reacting Vinyl Resins Is a Conjoint Polymer of a Vinyl Compound of the Structure $R.CH=CH_2$, Where R is a Radical of the Group Consisting of Halogen, Organic Radicals Having at Least One Benzene Ring, and Aliphatic Acyloxy Radicals, with an Unsaturated Carboxyl Compound of the Structure



Where R_1 and R_2 Are Radicals of the Group Consisting of Hydrogen, Lower Alkyl, Aryl, and Aralkyl, and R_3 and R_4 are Radicals of the Group Consisting Collectively of Oxygen and Individually of Hydroxyl and Lower Oxyalkyl, R_3 Being Hydroxyl When R_4 is a Lower Oxyalkyl Group. W. N. Stoops, Charleston, and W. A. Denison, South Charleston, both in W. Va., assignors to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,324,740. Liquid Coating Composition Stabilized against Gelation on Storage, Comprising a Dispersion in Aqueous Ammonia of a Conjoint Polymer of a Vinyl Compound of the Group Consisting of Styrene, Vinyl Acetate, and Vinyl Chloride with a Compound of the Group Consisting of Maleic Acid and Maleic Anhydride, and a Higher Polyalkylene Glycol in Which the Hydroxyl Groups Are Separated by at Least Three Alkylene Radicals Joined by Oxygen Atoms. W. N. Stoops, Charleston, and W. A. Denison, South Charleston, both in W. Va., assignors to Carbide & Carbon Chemicals Corp., a corporation of N. Y.

2,324,896. Mixed Polymerization Products Obtained by Polymerizing a Vinyl Sulphamide Selected from the Class Consisting of Those of the Formulae



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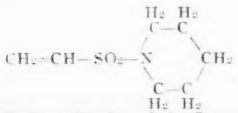


Wherein R_1 Is a Member of the Group Consisting of Alkyl, Aralkyl, and Aryl of the Benzene Series; R_2 Is a Member of the Group Consisting of Hydrogen, Aliphatic Acyl, and Alkyl; R_3 Is One of the Latter Two Members Only When R_1 Is Aryl, with a Different Polymerizable Vinyl Compound. W. Zerweck and W. Kunze, Frankfurt a.M. Fechenheim, Germany, assignors to General Aniline & Film Corp., New York, N. Y.

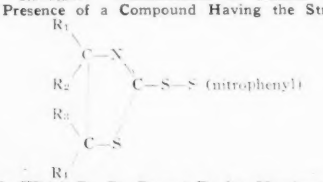
2,324,935. **Preparing, from Polymerizable Compounds of the Group Consisting of Methacrylic Acid, Esters, Nitrile, and Anhydride, Polymers Which Yield Solutions of Relatively Low Viscosity, by Polymerizing the Monomeric Compound in the Presence of from About 0.2% to about 5% of a Chlorinated, Unsaturated, Aliphatic Compound from the Group Consisting of Allyl Chloride, 2-Methallyl Chloride, Sym-Dichloro-Ethylene, Trichloroethylene, 1,2-Dichloropropylene and Dim. Sym-Dichloroethylene.** C. T. Kautter, Darmstadt, and E. Trommsdorff, Jugenheim-on-the-Bergstrasse, both in Germany, assignors to Rohm & Haas Co., Philadelphia, Pa.

2,325,177. **Polyvinyl Acetal Resin Plasticized with a Mixture of Dilauryl Phthalate and a Member of the Class Consisting of Diethylene Glycol and Dibutyl Diglycollate.** E. R. Derby, Springfield, Mass., assignor, by mesne assignments, to Monsanto Chemical Co., St. Louis, Mo.

2,325,178. **Polyvinyl Acetal Resin Plasticized with a Mixture of Phenyl Ethyl Alcohol and a Member of the Class Consisting of Dibutyl Diglycollate, Dibutyl Phthalate, and Diethyleneglycol Dibutyrate.** E. R. Derby, Springfield, Mass., assignor, by mesne assignments, to Monsanto Chemical Co., St. Louis, Mo.

2,325,202. **Treating Rubber by Vulcanizing It in the Presence of the Product Obtained by Reacting, at a Temperature of about 65 to 100° C., a Di(Arylamino) Methane and a Diarylamine in the Presence of Hydrochloric Acid.** A. M. Clifford, Stow, assignor to Wingfoot Corp., Akron, both in O.

2,325,259. **Vulcanization of Rubber in the Presence of a Compound Having the Structure**



in Which R_1, R_2, R_3 and R_4 Are Members of the Class Consisting of Hydrogen, Hydrocarbon, and Alkyl Ether Groups; and in the Presence of a Member of the Class Consisting of Monocarboxylic Acids and Their Metallic Salts. R. A. Mathes, Akron, and P. C. Jones, Silver Lake, both in O., assignors to B. F. Goodrich Co., New York, N. Y.

2,325,398. **Production of Butadiene, Which Includes Heating a Butyne to a Temperature Favoring the Rearrangement of the Acetylenic Hyddocarbons to Butadiene, but below the Temperature at Which Substantial Decomposition of the Carbon Structure Occurs, in the Presence of a Catalyst Comprising an Alumina, Which Is Alumina Alpha Monohydrate Prepared by Partial Dehydration of Alpha Alumina Trihydrate Precipitated from an Aluminate Solution, and Separating the Butadiene from the Unreacted Acetylenic Hydrocarbons.** G. W. Hearne and G. A. Stenmark, Berkeley, assignors to Shell Development Co., San Francisco, all in Calif.

2,325,513. **Preparing Halogenated Polymeric Vinyl Compounds by Introducing a Halogen into a Medium Comprising Substantially Anhydrous Acetic Acid and a Polymeric Vinyl Compound Selected from the Group Consisting of Polyvinyl Alcohol and Its Esters and Acetals.** W. O. Herrmann, Diesenhofen, and W. Haehnel, Munich, both in Germany; vested in the Alien Property Custodian.

2,325,562. **Plastic Adhesive Rubber Compound for Providing Non-Slip Cementation Resistant of Temperatures as High as 100° C., Comprising: an Aqueous Dispersion Containing from 9½ to 11 Parts Rubber, from 7½ to 12½ Parts of a Tack-Producing Material Consisting Essentially of an Ester Gum, a Fractional Part of a Saponifying Agent for the Tack-Producing Material and from ¾ to 1½ Parts of a Peptizing Agent for Inhibiting Coagulation of the Rubber in the Dispersion.** H. E. Wening, Dayton, O., assignor to General Motors Corp., Detroit, Mich.

Dominion of Canada

413,866. **Gas Barrier Comprising a Film of Polymer Formed from a Mixture of Isobutylene and Butadiene and Containing Combined Sulphur and Fillers.** Standard Oil Development Co., Linden, assignee of W. J. Sparks, Cranford, and R. M. Thomas, Union, all in N. J., U. S. A.

413,895. **Purification of Rubber, Balata, Gutta Percha, Jelutong, Abiurana, Gondang, and the Like, Including Treating Such a Latex with a Dilute Caustic Alkali at Elevated Temperatures to Cause a Precipitation of Heavy Impurities Therein, Separating a Small Fraction Containing the Heavy Impurities without Substantial Change in the Rubber Content of the Latex, and Then Dialyzing the Latex so Treated to Further Purify It.** Gouvernements Landbouwbedrijven, assignee of H. R. Braak, both of Batavia-Centrum, Java, Netherlands India.

United Kingdom

554,121. **Synthetic Resins.** British Thomson-Houston Co., Ltd.

554,123. **Carbon Black.** R. H. H. Morley.

554,124. **Halogenation of Poly-Olefinic Ethers.** Shell Development Co.

554,155. **Carbon Black.** R. H. H. Morley.

MACHINERY

United States

2,323,144. **Tire Spreader Including a Friction Rod, a Bead-Engaging Member Secured to One End of the Rod, and a Friction Jack Movable along the Rod.** A. Long, Menominee, Mich.

2,324,804. **Apparatus to Clean Tanks Having Sides with Flexible Sheet Rubber Margins Adapted to Bear Yieldingly against an Oil-Bearing Surface.** J. Van Gelderen, Union City, N. Y.

2,324,977. **Latex Depositing Apparatus Having Means for Receiving a Continuous Film of Latex, a Nozzle with a Discharge End above the Receiving Means, the Nozzle Forming an Acute Angle with the Receiving Means; the Discharge End Is Outwardly Flared along All Planes Which Intersect the Axis of the Nozzle.** G. P. Bosomworth, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,981. **Vulcanizing Apparatus Including a Vulcanizer, a Circulatory System of Relatively Low Pressure Steam, a Superheater for Air or Steam in Communication with an Article within the Vulcanizer, Means Discharging High-Pressure Steam into the Superheater to Heat the Same, and a Piping Connection between the Superheater and the Circulatory System Whereby the Superheating Steam Is Returned to the Latter, the Piping Connection Discharging into the Circulatory System through an Ejector to Assist in Maintaining Circulation in the System.** G. P. Bosomworth, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,982. **Apparatus to Expand and Shape Annular Articles, Including an Annular Support, a Circumferential Series of Radially Movable Slides, a Second Series of Radially Movable Slides, Means for Moving the Last-Mentioned Slides Radially Outwardly to Expand the Annular Article on the Work-Support, and Means for Moving the Other Series of Slides Inwardly for Shaping a Local Circumferential Region of the Article.** M. O. Kuhn, Cuyahoga Falls, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,324,985. **Apparatus for Tire Production, Including a Movable Carrier, a Stock-Supply Unit Disposed beside the Carrier, Means for Moving a Movable Stock Rack with the Carrier for Determinate Distance, and Means for Returning the Stock Rack to Its Initial Position.** H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,986. **Tire Shaping Apparatus, Including a Vertically Reciprocable Hollow Cylinder, a Vertically Reciprocable Hook within the Cylinder, and Electrically Operating Control Means for the Cylinder.** R. W. Allen, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,991. **Vulcanization Apparatus for Annular Rubber Articles Having a Portion of Their Outer Peripheries Exposed When Placed in the Molds therefor.** C. W. Groncy and E. Heck, assignors to Firestone Tire & Rubber Co., all of Akron, O.

2,325,204. **Apparatus for Vulcanizing Endless Rubber Belts, Sheet Material, and the Like Including a Relatively Wide, Endless, Flexible, Inextensible Band, Collapsible Means Positioned Inside the Band and Adapted to Engage the Inner Periphery of Rubber Material to Be Vulcanized and Adapted to Force It Outwardly into Pressure Engagement with the Band, and Means Adapted to Supply Vulcanizing Heat to the Rubber Material.** K. B. Kilborn, assignor to Wingfoot Corp., both of Akron, O.

United Kingdom

552,961. **Molds for Curing Inflatable Rubber Articles.** Dill Mfg. Co.

553,617. **Bearings of Rolling Mill, Mixers, Calenders, or Like Apparatus for Acting on Rubber or Similar Substances** J. Brown and D. Bridge & Co., Ltd.

554,082. **Molding and Vulcanizing Apparatus.** H. Willshaw and Dunlop Rubber Co., Ltd.

554,252. **Apparatus and Method for Vulcanizing Belts and the Like.** Wingfoot Corp.

UNCLASSIFIED

United States

2,323,917. **Tire Chain-Applying Tool Including a Straight Base Member Adapted to Be Placed Crosswise of a Tire.** E. L. Kibler, Pittsburgh, Pa.

2,324,583. **Cord for Covers of Pneumatic Tires and Other Reenforced Articles of Rubber and Similar Materials.** T. Jackson and T. B. Frearson, both of Spondon, England, assignors to Celanese Corp. of America, a corporation of Del.

2,324,618. **Reduced Tire Pressure Indicator.** O. E. Dietrich, Morton, Ill.

2,324,987. **Control System.** W. J. Secrest, Cuyahoga Falls, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,324,988. **Apparatus for Aerating Viscous Liquids.** H. W. Greenup, Fall River, Mass., and N. Johnston, Alhambra, Calif., assignors to Firestone Tire & Rubber Co., Akron, O.

2,324,990. **Hard, Shiny Finished Cement Mold Comprising a Uniform Mixture of Cement, Calcium Chloride, a Wetting Agent, the Surface of the Mold Being impregnated with Grease, and Asbestos Fibers Distributed through the Interior of the Mold.** M. Carter, Trenton, N. J., assignor to Firestone Tire & Rubber Co., Akron, O.

2,324,992. **Resilient Support for Pipes, Etc.** E. F. Riesing, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,993. **Rail Insulator.** L. R. M. Kubaugh, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,997. **Resilient Coupling.** R. W. Brown, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,998. **Indicating Depth Gage.** M. R. Dague, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,324,999. **Gravity Operable Valve.** B. H. Shinn, Butler, Pa., assignor to Firestone Tire & Rubber Co., Akron, O.

2,325,000. **Welding Apparatus.** M. O. Kuhn, Cuyahoga Falls, assignor to Firestone Tire & Rubber Co., Akron, both in O.

2,325,001. **Collapsible Form.** F. M. McLaughlin, assignor to Firestone Tire & Rubber Co., both of Akron, O.

2,325,002. **Band Cutter.** R. W. Allen and S. V. Carlsten, assignors to Firestone Tire & Rubber Co., all of Akron, O.

TRADE MARKS

United States

402,059. Representation of a double-lined rectangle encasing the words: "**Arronne Modes**", Shoes. A. W. Mckay, Sacramento, Calif.

402,074. Representation of a label containing the words: "**Phil Karb Carbon Black.**" Carbon black. Phillips Petroleum Co., Bartlesville, Okla.

402,075. Representation of a label containing the words: "**Kcolex Carbon Black.**" Carbon black. Phillips Petroleum Co., Bartlesville, Okla.

402,076. Representation of a label containing the words: "**Phil Lex Carbon Black.**" Carbon black. Phillips Petroleum Co., Bartlesville, Okla.

402,080. **Sumgum.** Resin. R. T Vanderbilt Co., Inc., New York, N. Y.

402,153. Representation of a nipple containing the words: "**Donaldson's 'Kant Kollapse' Nipple.**" Nurser nipples. M. E. Donaldson, doing business as Donaldson Nipple Co., West Hartford, Conn.

Market Reviews

COMPOUNDING INGREDIENTS

SYNTHETIC rubber may be in for a lull. Although June expansion at government-financed plants swelled 7% over the May quota, July is expected to reveal a radical drop. The June figure amounted to $47,738,000, bringing the six-month total to $283,895,000, nearly half of the currently scheduled program. But third-quarter volume is anticipated to dive 35% below the volume of the second quarter.

ALCOHOL. No ethyl alcohol is now being made from corn; production is mainly from wheat, rye, and some other grains plus molasses. Supply seems adequate to meet all synthetic rubber needs and other essential requirements stemming directly from the war. Allocation to less essential industries is negligible as a tight rein controls available supplies.

BARYTES. Only a routine business is recorded. Prices are well maintained.

BENZOL. Increasing aviation gasoline and synthetic rubber needs are pulling heavily on the government stockpile. Manufacturers who use less than 50 gallons of benzol a month are now required to certify to the supplier and WPB that they are not exceeding that amount.

CARBON BLACKS. Shipments of gas black continue ahead of current production, with producers' stocks still shrinking. Takings of furnace black are increasing commensurately with synthetic rubber production. Because of enlarged output, there is an easing in the general situation regarding semi-reenforcing blacks.

CASEIN. With the flow of milk steadily diminishing in many parts of the country because of a dearth of cattlefeed and labor, domestic production of casein has fallen to meager proportions. There is little promise of amelioration inasmuch as the dairies can sell their unprocessed dried skim milk in that form to greater advantage than by making it into casein and selling that product at the ceiling prices fixed by OPA. With no universally satisfactory substitutes on hand, the only way of filling more than a small percentage of the allocations lies in obtaining stocks from Argentina. Latest advices from that country indicate that at this writing some shipments to the United States have already been arranged, but delivery is about a month off. To date, permission has been granted for the importation of 3,850 tons, but it is understood that between 7,000 and 8,000 tons will be permitted to be sent here before the end of the year if adequate cargo space becomes available. Present stocks in Argentina are approximated at 17,000 tons. Prices now quoted for this casein run around 12¢ to 12½¢ per pound, cost and freight Buenos Aires.

CHINA CLAY. Moderate quantities are being taken up. Stocks, including recent importations from England, are sufficient for present requirements.

PIGMENTS. Demand for litharge from civilian users is waning, but takings for war production are still sizable. Movement of lithopone into military and lend-lease channels is keeping up fairly well, but buying for civilian account continues its lag.

RUBBER SOLVENTS. Absorption by the synthetic rubber industry reaches larger proportions daily. Prices are well maintained.

RUBBER SUBSTITUTES. Heavy demand is expected to continue for some time.

SYNTHETIC RESINS. Demand for phenolic, formaldehyde, phthalic alkyd, vinyl chloride, and vinyl polymer lines continues on the upgrade. Non-essential users are studying the WPB's recently issued list of end-uses on which applications for allocations can be made, in the hope of finding good and sufficient reasons for granting of their requests for the buying privilege.

TOLUOL. A tapering off of explosive requirements is reported; in consequence, industrial consumers now anticipate increased allotments shortly. Prices are firm.

WAXES. Amorphous waxes are moving steadily mounting volumes into consuming straits. Supplies are still only moderate-sized. Prices are firmly held.

ZINC OXIDES. Synthetic rubber producers draw off steadily increasing amounts of zinc oxides. But though American-process oxides are moving more freely, takings of French process oxides continue restricted by need for authorization to purchase slab zinc. Prices are stable.

Current Quotations*

Abrasives

Pumicestone, powdered	lb.	$0.035	/$0.04
Rottenstone, domestic	lb.	.025	/.03

Accelerators, Inorganic

Lime, hydrated, f.o.b. New York	ton	25.00	
Litharge (commercial)	lb.	.09	
Magnesia, calcined, heavy technical, light	lb.	.0625	/.07

Accelerators, Organic

A-1	lb.	.28	/ .33
A-10	lb.	.36	/ .42
A-19	lb.	.52	/ .65
A-32	lb.	.60	/ .70
A-46	lb.	.50	/ .57
A-77	lb.	.42	/ .55
A-100	lb.	.42	/ .55
Accelerator 49	lb.	.41	/ .42
808	lb.	.59	/ .61
833	lb.	1.13	/ 1.15
Acrin	lb.	.65	
Advan	lb.	.55	
Aldehyde ammonia	lb.	.65	/ .70
Altax	lb.	.43	/ .45
Arazate	lb.	1.53	
B-J-F	lb.	.38	/ .43
Beutene	lb.	.59	/ .64
Butasan	lb.	1.13	
Butazate	lb.	1.13	
Butyl Eight	lb.	.97	/ .99
C-P-B	lb.	1.95	
Captax	lb.	.38	/ .40
D-B-A	lb.	1.95	/
Delac A	lb.	.30	/ .48
O	lb.	.39	/ .48
P	lb.	.39	/ .48
Di-Esterex-N	lb.	.50	/ .57
DOTG (Diorthotolyguanidine)	lb.	$0.44	/$0.46
DPG (Diphenylguanidine)	lb.	.35	/ .36
El-Sixty	lb.	.40	/ .47
Erie Accelerator	lb.	.60	/ .62
Ethasan	lb.	1.13	
Ethazate	lb.	1.13	
Ethylideneaniline	lb.	.42	/ .43
Formaldehyde P.A.C.	lb.	.06	/ .0625
Formaldehyde-para-toluidine	lb.	.63	/ .65
Formaniline	lb.	.36	/ .37
Guantal	lb.	.39	/ .48
Hepteen	lb.	.34	/ .39
Base	lb.	1.25	/ 1.40
Hexamethylenetetramine U.S.P.	lb.	.39	
Technical	lb.	.33	
Lead oleate, No. 999	lb.	.135	
Witco	lb.	.15	
Ledate	lb.	1.48	
M-B-T	lb.	.38	/ .40
M-B-T-S	lb.	.43	/ .45
Methasan	lb.	1.23	
Methazate	lb.	1.23	
Monex	lb.	1.53	
Morfex "33"	lb.	.67	/ .72
"55"	lb.	.96	/ 1.01
O-X-A-F	lb.	.38	/ .43
Para-nitroso-dimethylaniline	lb.	.85	
Pentex	lb.	.74	/ .84
Flour	lb.	.1225	/ .1325
O	lb.		
Flour	lb.		
Phenex	lb.	.49	/ .54
Pipazate	lb.	1.53	
Pip-Pip	lb.	1.63	
R & H 50-D	lb.	.42	/ .43
Rotax	lb.	.48	/ .50
Safex	lb.	1.15	/ 1.25
Santocure	lb.	.60	/ .67
Selenac	lb.	1.98	
SPDX	lb.	.69	/ .74
A	lb.	.69	/ .74
SRA No. 1	lb.	.38	/ .50
Super Sulphur No. 2	lb.	.13	/ .15
Tetrone A	lb.	2.20	
Thiocarbanilide	lb.	.28	/ .33
Thiofide	lb.	.43	/ .50
Thionex	lb.	1.53	
Thiotax	lb.	.38	/ .45
Thiurad	lb.	1.53	
Thiuram E	lb.	1.53	
M	lb.	1.53	
Trimene	lb.	.54	/ .64
Base	lb.	1.03	/ 1.18
Triphenylguanidine (TPG)	lb.	.45	
Tuads, Methyl	lb.	1.53	
Tuex	ton	1.53	
2-MT	lb.	.58	/ .60
Ulto	lb.	.99	/ 1.04
Ureka	lb.	.50	/ .57
Blend B	lb.	.50	/ .57
C	lb.	.48	/ .55
Vulcanex	lb.	.42	/ .43
Z-B-X	lb.	2.45	
Zenite	lb.	.40	/ .42
A	lb.	.45	/ .47
B	lb.	.42	/ .44
Zimate, Butyl	lb.	1.13	
Ethyl	lb.	1.13	
Methyl	lb.	1.23	
Zipacel	lb.	1.65	

Activators

Aero Ac 50	lb.	.46	/ .52
Barak	lb.	.50	
MODX	lb.	.295	/ .345
SL-20	lb.	.1089	/ .1135

Age Resisters

AgeRite Alba	lb.	1.95	/ 2.05
Gel	lb.	.52	/ .54
Hipar	lb.	.61	/ .63
Powder	lb.	.43	/ .45
Resin	lb.	.43	/ .45
D	lb.	.43	/ .45
White	lb.	1.23	/ 1.33
Akroflex C	lb.	.53	/ .65
Albasan	lb.	.69	/ .74
Aminox	lb.	.43	/ .52
Antox	lb.	.54	/ .56
Betanox	lb.	.43	/ .52
B-L-E	lb.	.43	/ .52
Powder	lb.	.61	/ .70
B-X-A	lb.	.43	/ .52
Copper Inhibitor X-872-A	lb.	1.15	
Flectol H	lb.	.45	/ .55
White	lb.	.89	/ 1.00
M-U-F	lb.	1.48	
Neozone (standard)	lb.	.61	/ .63
A	lb.	.43	/ .45
C	lb.	.43	/ .55
D	lb.	.43	/ .45
Distilled	lb.	.48	/ .50
E	lb.	.61	/ .63
Oxynone	lb.	.77	/ .90
Permalux	lb.	1.18	/ 1.20
Santoflex B	lb.	.45	/ .55
BX	lb.	.56	/ .64
Santovar O	lb.	1.35	/ 1.40
Stabilite	lb.	.48	/ .69
Alba	lb.	.50	/ .74
Thermoflex A	lb.	.61	/ .63
C	lb.	.54	/ .56
Tysonite	lb.	.165	/ .17
V-G-B	lb.	.43	/ .52

Alkalies

Caustic soda, flake, Columbia (400-lb. drums)	100 lbs.	2.70	/ 3.55

*Prices in general are f.o.b. works. Range indicates grade or quantity variations. Space limitation prevents listing of all known ingredients. Prices are not guaranteed, and those readers interested should contact suppliers for spot prices.

Liquid, 50%	100 *lbs.*	$1.95	
Solid (100-*lb. drums*)	100 *lbs.*	2.30	/$3.15

Antiscorch Materials

Antiscorch T	*lb.*	.90	
Cumar RH	*lb.*	.105	
E-S-E-N	*lb.*	.34 /	.39
R-17 Resin (*drums*)	*lb.*	.1075	
RM	*lb.*	1.25	
Retarder W	*lb.*	.36	
Retardex	*lb.*	.445 /	**.475**
U-T-B	*lb.*	.34 /	.39

Antiseptics

Compound G-4	*lb.*	1.25	
G-11	*lb.*	5.65	

Antisun Materials

Heliozone	*lb.*	.23 /	.24
S.C.R.	*lb.*	.32 /	**.34**
Sunproof	*lb.*	.2275/	.2775
Jr.	*lb.*	.165 /	.215

Blowing Agents

Ammonium Carbonate, lumps (500-*lb. drums*)	*lb.*	.0825	
Unicel	*lb.*	.50	

Brake Lining Saturant

B.R.T. No. 3	*lb.*	.0175/	**.0185**

Colors

Black

Du Pont powder	*lb.*	.42	
Lampblack (commercial), *l.c.l.*	*lb.*	.15	

Blue

Du Pont Dispersed	*lb.*	.35 /	.95
Powders	*lb.*	2.25 /	3.75
Heliogen BKA	*lb.*		
Toners	*lb.*		

Brown

Mapico	*lb.*	.1135	

Green

Chrome	*lb.*	.25	
Oxide (*freight allowed*)	*lb.*	.24	
Du Pont Dispersed	*lb.*	.98 /	2.85
Powders	*lb.*	1.00	
Guignet's (*bbls.*)	*lb.*	.70	
Toners	*lb.*		

Orange

Du Pont Dispersed	*lb.*	.88/	2.35
Powders	*lb.*	2.75/	3.05
Toners	*lb.*		

Orchid

Toners	*lb.*	**	

Pink

Toners	*lb.*	**	

Purple

Toners	*lb.*	**	

Red

Antimony Crimson, 15/17%	*lb.*		
R.M.P. No. 3	*lb.*	.48	
Sulphur free	*lb.*	.52	
Golden 15/17%	*lb.*		
7-A	*lb.*	.37	
Z-2	*lb.*	.25	
Cadmium, light (400-*lb. bbls.*)	*lb.*	.85 /	
Du Pont Dispersed	*lb.*	.93 /	2.05
Powders	*lb.*	.60 /	1.65
Iron Oxide, *l.c.l.*	*lb.*	.07 /	.15
Mapico	*lb.*	.0885/	.096
Rub-Er-Red (*bbls.*)	*lb.*	.0975	
Toners	*lb.*		

White

Lithopone (*bags*)	*lb.*	.0425/	.045
Albalith	*lb.*	.0425/	.045
Astrolith (50-*lb. bags*)	*lb.*	.0425/	
Azolith	*lb.*	.0425/	.045
Titanium Pigments			
Ray-Bar	*lb.*	.0575/	.0625
Ray-Cal	*lb.*	.055 /	.06
Rayox	*lb.*	.145 /	.155
Titanolith (50-*lb. bags*)	*lb.*	.056 /	.0575
Titanox-A LO and MO	*lb.*	.115 /	.15
C	*lb.*	.055 /	.0575
Ti-Tone	*lb.*		
Zopaque (50-*lb. bags*)	*lb.*	.145 /	.1525
Zinc Oxide			
Azo ZZZ-11	*lb.*	.0725/	.075
44	*lb.*	.0725/	.075
55	*lb.*	.0725/	.075
66	*lb.*	.095 /	**.0975**
French Process, Florence			
Green Seal-8	*lb.*	.09 /	.0925
Red Seal-9	*lb.*	.085 /	.0875
White Seal-7	*lb.*	.095 /	.0975
Kadox, Black Label-15	*lb.*	.0725/	.075
No. 25	*lb.*	.085 /	.0875
72	*lb.*	.0725/	.075
Red Label-17	*lb.*	.0725/	.075
Horse Head Special 3	*lb.*	.0725/	.075
XX Red-4	*lb.*	.0725/	.075
23	*lb.*	.0725/	.075
72	*lb.*	.0725/	.075
78	*lb.*	.0725/	.075
80	*lb.*	.0725/	.075
103	*lb.*	.0725/	.075
110	*lb.*	.0725/	.075
St. Joe (lead free)			
Black Label	*lb.*	.0725/	.075
Green Label	*lb.*	.0725/	.075
Red Label	*lb.*	.0725/	.075
U.S.P.	*lb.*	.105 /	.1075
Zinc Sulphide Pigments			
Cryptone-BA-19	*lb.*	$0.056 /	$0.0585
BT	*lb.*	.056 /	.0585
CB	*lb.*	.056 /	.0585
MS	*lb.*	.0575/	.06
ZS No. 20	*lb.*	.0825/	.085
86	*lb.*	.0825/	.085
230	*lb.*	.0825/	.085
800	*lb.*	.0825/	.085
Sunolith	*lb.*	.0425/	

Yellow

Cadmolith (cadmium yellow), (400-*lb. bbls.*)	*lb.*	.60	
Du Pont Dispersed	*lb.*	1.25 /	1.85
Powders	*lb.*	.70 /	1.75
Mapico	*lb.*	.0685/	.071
Toners	*lb.*		

Dispersing Agents

Bardex	*lb.*	.0425/	.045
Bardol	*lb.*	.025 /	.0275
B	*lb.*	.05 /	.0525
Nevoll (*drums, c.l.*)	*lb.*	.02 /	.025

Extenders

Advagum 1098	*lb.*	.42	
1198	*lb.*	.40	
Extendex C	*lb.*		
Naftolen	*lb.*	.15 /	.20
Oroplast	*lb.*	.11 /	.155
"600"	*lb.*	.14 /	.16
Vanzak	*gal.*	.05 /	.06

Fillers, Inert

Asbestine, *c.l.*	*ton*	20.00	
Asbestos Fiber	*ton*	15.50 /	48.00
Barytes	*ton*	40.00	
f.o.b., St. Louis (50-*lb. paper bags*)	*ton*	25.55	
Off color, domestic	*ton*	29.00	
White, domestic	*ton*	38.50 /	40.00
Blanc fixe, dry, precip.	*ton*	80.00	
Calcene	*ton*	37.50 /	43.00
Infusorial earth	*lb.*	.0225	
Kalite No. 1	*ton*	26.00	
3	*ton*	36.00	
Kalvan	*ton*	100.00	
Magnesium Carbonate *l.c.l.*	*lb.*	.0725/	.1075
Paradene No. 2 (*drums*)	*lb.*	.0525	
Pyrax A	*ton*	7.50	
Whiting			
Suprex White	*ton*	32.50	
Witco, *c.l.*	*ton*	8.00	
Witcal	*ton*	100.00	
Witcarb R-12	*ton*	40.00	

Finishes

Mica, *l.c.l.*	*ton*	20.00	/85.00
Rubber lacquer, clear	*gal.*	1.00 /	2.00
Colored	*gal.*	2.00 /	3.50
Shoe varnish	*gal.*	1.45	
Talc	*ton*	25.00	/35.00

Flock

Cotton flock, dark	*lb.*	.095 /	.112
Dyed	*lb.*	.45 /	.85
White	*lb.*	.12 /	.20
Rayon flock, colored	*lb.*	1.00 /	1.50
White	*lb.*	.75 /	1.25

Latex Compounding Ingredients

Accelerator 552	*lb.*	1.63	
Aerosol OT Aqueous 25% (*drum*)	*lb.*	.35	
Antox, dispersed	*lb.*	.54	
Aquarex D	*lb.*	.75	
F	*lb.*	.85	
MDL Paste	*lb.*	.25	
Areskap No. 50	*lb.*	.18 /	.24
100, dry	*lb.*	.39 /	.51
Aresket No. 240	*lb.*	.16 /	.22
300, dry	*lb.*	.42 /	.50
Areskleno No. 375	*lb.*	.35 /	.50
400 dry	*lb.*	.51 /	.65
Black No. 25, dispersed	*lb.*	.22 /	.40
Casein	*lb.*	.24 /	.2775
Color Pastes, dispersed	*lb.*	.75 /	1.10
Copper Inhibitor X-872	*lb.*	2.25	
Darvan No. 1	*lb.*	.30 /	.34
2	*lb.*	.30 /	.34
3	*lb.*	.30 /	.34
Dispersex No. 15	*lb.*	.11 /	.12
No. 20	*lb.*	.08 /	.10
Factex Dispersion A	*lb.*	.185	
Heliozone, dispersed	*lb.*	.25	
MICRONEX, Colloidal	*lb.*	.06	
Neoprene Latex Extender Emulsion 17	*lb.*	.12	.14
R-2 Crystals	*lb.*	1.55	
S-1 (400-*lb. drums*)	*lb.*	.65	
Santobrite Briquettes	*lb.*		
Powder	*lb.*		
Santomerse D	*lb.*	.41 /	.65
S	*lb.*	.11 /	.25
Sodium Stearate	*lb.*	.40	
Stablex A	*lb.*	.90 /	1.10
B	*lb.*	.70 /	.95
C	*lb.*	.40 /	.50
Sulphur, dispersed	*lb.*	.10 /	.15
No. 2	*lb.*	.08 /	.12
T-1 (440-*lb. drums*)	*lb.*	.40	
Tepidone	*lb.*	.63	
Tetrone A	*lb.*	2.20	
Tysonite, dispersed	*lb.*	.32 /	.35
Zenite Special	*lb.*	.47	
Zinc oxide, dispersed	*lb.*	.12 /	.15

**Because of difficulty in interpreting OPA ceilings, consumers should contact supply houses for prices.

Mineral Rubber

Black Diamond, *l.c.l.*	*ton*	$25.00	/$30.00
B.R.C. No. 20	*lb.*	.0105	/01.15
Hydrocarbon, Hard	*ton*	25.00	/27.00
MilliMar	*lb.*	.055	
Parmr	*ton*		
Pioneer, *c.l.*	*lb.*	25.00	/30.00
285°-300°	*ton*	25.00	/27.00

Mold Lubricants

Aluminum Stearate	*lb.*	.23 /	.24
Aquarex D	*lb.*	.75	
MDL Paste	*lb.*	.25	
Colite	*gal.*	.90 /	1.15
Dipez Mold Wash	*lb.*		
Lubrex	*lb.*	.25 /	.30
Rubber-Glo, conc. regular	*gal.*	.94 /	1.15
Type W	*gal.*	.99 /	1.20
Sericite	*ton*	65.00	
Soapstone, *l.c.l.*	*ton*	25.00	/35.00
Zinc Stearate	*lb.*	.30 /	.31

Oil Resistant

A-X-F	*lb.*	.82 /	.85

Reclaiming Oils

B.R.V.	*lb.*	.035 /	**.0375**
C-10	*gal.*	.19 /	.24
D-4	*gal.*	.17 /	.22
E-5	*gal.*	.15 /	.20
No. 1621	*lb.*	.021 /	.0235
S.R.O.	*lb.*	.02 /	**.0225**
X-60 (reclaiming)	*gal.*	.20 /	.27
X-443	*gal.*	.29	

Reenforcers

Alumina, Hydrated			
Alorco C-740	*lb.*	.0375/	.065
C-741	*lb.*	.0375/	.065
Buca	*ton*	40.00	
Carbon Black			
Aerfloted Arrow Specification (*bags only*)	*lb.*	.0355†	
Arrow Compact Granulized	*lb.*	.0355†	
Certified Heavy Compressed (*bags only*)	*lb.*	.0355†	
SPHERON	*lb.*	.0355†/	.07
Channel "S"	*lb.*	.12	
Continental, dustless	*lb.*	.0355†	
"AA"	*lb.*		
Compressed (*bags only*)	*lb.*	.0355†	
Disperson	*lb.*	.0355†	
Dixie	*lb.*	.0355†	
20	*lb.*	.035†	
Dixiedensed	*lb.*	.0355†	
66	*lb.*	.0355†	
77	*lb.*	.0355†	
Furnex	*lb.*	.035	
Beads	*lb.*	.035	
Gastex	*lb.*	.035 /	.06
HX	*lb.*	.0355†	
Kosmobile	*lb.*	.0355†	
66	*lb.*	.0355†	
77	*lb.*	.0355†	
S	*lb.*	.0355†	
Kosmos	*lb.*	.0355†	
20	*lb.*	.035†	
MICRONEX Beads	*lb.*	.0355†	
Hi-Tear	*lb.*	.0355	
Mark II	*lb.*	.0355	
Standard	*lb.*	.0355	
W-5	*lb.*	.0355	
W-6	*lb.*	.0355	
P-33	*lb.*	.0475	
Pelletex	*lb.*	.035 /	.06
SPHERON C (*bags*)	*lb.*	.0455†	
I (*bags*)	*lb.*	.0405	
N (*bags*)	*lb.*	.15	
T (*bags*)	*lb.*	.09	
Statex	*lb.*		
STERLING	*lb.*	.035	
Thermax	*lb.*	.0225	
"S"	*lb.*	.0675	
TX	*lb.*	.0355†	
Velvetex	*lb.*		
"WYEX BLACK"	*lb.*	.0355†	
Carbonex Flakes	*lb.*	.03 /	.035
S	*lb.*	.031 /	.036
Plastic	*lb.*	.031 /	.0335
Clays			
Aerfloted Hi-White	*ton*	10.00	
LGB	*ton*	15.00	
Paragon (50-*lb. bags*)	*ton*	10.00	
Suprex (50-*lb. bags*)	*ton*	10.00	/23.50
Catalpo, *c.l.*	*ton*	30.00	
China	*ton*	25.00	
Dixie	*ton*	10.00	/22.50
"L"	*ton*	10.00	
Langford	*ton*	8.50	
McNamee	*ton*	10.00	
Par	*ton*	10.00	
Paraforce, *c.l.*	*ton*	50.00	
#33	*ton*	30.00	
Witco, *c.l.*	*ton*	10.00	
Cumar EX	*lb.*	.05	
MH	*lb.*	.065 /	.115
V	*lb.*	.095 /	.125
465 Resin	*lb.*		
"G" Resin	*lb.*		
Nevindene	*lb.*		
Silene "EF"	*lb.*	.055 /	.06

Reodorants

Amora A	*lb.*		
B	*lb.*		
C	*lb.*		
D	*lb.*		

†Price quoted is f.o.b. works (bags). The price f.o.b. works (bulk) is $0.033 per pound. All prices are carlot.

Para-Dors (ABCD)	lb.	$1.00	/ $3.40
Rodo No. 0	lb.	4.00	/ 4.50
10	lb.	5.00	/ 5.50
Rubber Substitutes			
Black	lb.	.095	/ .17
Brown	lb.	.095	/ .18
White	lb.	.10	/ .20
Factice			
Amberex Type B	lb.	.20	
Brown	lb.	.095	/ .19
Neophax A	lb.	.165	
B	lb.	.165	
White	lb.	.10	/ .20
Polyester, Millable 56-40A	lb.	.36	.38
Vulprene 72-28AR	lb.	.38	.45
Dispersion B7-41	lb.	.25	.26
Emulsion D4-31A	lb.	.29	.30
Softeners and Plasticizers			
Ambidex Regular	lb.		
S	lb.		
B.R.T. No. 7	lb.	.02	/ .021
Bondogen	lb.	.98	/ 1.05
Buna Modifier 56-10	lb.	.30	/ .31
Bunnatol (for synthetic rubber)	lb.		
G	lb.	.40	/ .50
S	lb.	.40	/ .50
Burgundy pitch	lb.		
Copene Resin	lb.	.32	
Dipolymer Oil	gal.	.33	/ .38
Dispersing Oil No. 10	lb.	.0375	/ .04
Falkomer 106	lb.	.30	
108	lb.	.30	
LM-Nypene (*drums*)	lb.	.25	
LX-436 (*tank car*)	lb.	.027	
Myristilene	lb.	.20	/ .30
Nevinol	lb.	.13	/ .14
Nuba resinous pitch (*drums*)			
Grades No. 1 and No. 2	lb.	.29	
3-X	lb.	.0425	
Nypene Resin	lb.	.32	
Palm oil (Witco), *c.l.*	lb.		
Palmalene	lb.	.15	/
Palmol	lb.	.16	.25
Para Flux (reg.)	gal.	.17	/ .18
No. 2016	gal.	.135	/ .19
Para Lube	lb.	.046	/ .048
Paradene No. 1 (*drums*)	lb.	.0525	
Special (*drums*)			
20 to 35° C. M.P.	lb.	.0625	
35 to 45° C. M.P.	lb.	.0625	
45 to 75° C. M.P.	lb.	.0575	
Peptizene	lb.	.65	
Piccocizer "30"	lb.		
Piccolyte Resins	lb.	.15	/ .185
Piccoumaron Resins	lb.	.045	/ .15
Pictar	gal.	.18	/ .23
Pine tar	gal.		
Oil	gal.	.45	
Plasticizer B	lb.	.35	/ .45
Plastoflex No. 10	lb.	.20	
No. 20	lb.	.25	
Plastogen	lb.	.0775	/ .08
Plastone	lb.	.27	/ .30
R-19 Resin (*drums*)	lb.	.1075	
21 Resin (*drums*)	lb.	.1075	
Reogen	lb.	.115	/ .12
RPA No. 1E	lb.	.55	
2	lb.	.65	
3	lb.	.46	
4	lb.	.80	
Tarzac	lb.	.23	/ .24
Tonox	lb.	.50	/ .59
Turgum	lb.	.07	/ .0735
S	lb.	.0625	.0675
Vistac No. 1	lb.	.20	/ .214
No. 2	lb.	.214	/ .227
Witco No. 20, *l.c.l.*	gal.	.20	
X-1 resinous oil (*tank car*)	lb.	.011	/ .016
XX-100 Resin	lb.	.0525	
Softeners for Hard Rubber Compounding			
Resin C Pitch 45°C. M.P.	lb.	.015	/ .016
60°C. M.P.	lb.	.015	/ .016
75°C. M.P.	lb.	.015	/ .016
Solvents			
Beta-Trichlorethane	lb.	.20	
Carbon Bisulphide	100 lbs.	5.75	
Tetrachloride	gal.	.80	
Cosol No. 1	gal.	.26	
No. 2	gal.	.25	
No. 3	gal.	.22	
Industrial 90% benzol (*tank car*)	gal.	.15	/ .22
Nevsol	gal.	.245	/ .31
Picco	gal.	.22	/ .32
Skellysolve	gal.		
Stabilizers for Cure			
Barium Stearate	lb.	.29	/ .32
Calcium Stearate	lb.	.26	/ .27
Laurex (*bags*)	lb.	.1475	/ .1725
Lead Stearate	lb.		
Magnesium Stearate	lb.	.31	/ .32
Stearex B	lb.		
Beads	lb.		
Stearic acid, single pressed	lb.		
Stearite, *c.l.*	lb.	.1487	
Zinc Laurate	lb.	.29	/ .32
Stearate	lb.	.30	/ .31
Synthetic Rubber			
Agripol Solids *l.c.*	lb.	.44	/ .52
Solutions *l.c.*	lb.	.27	/ .29
Hycar OR-15	lb.	.63	
OR-25	lb	.56	
OS-10	lb.	.56	
Neoprene Latex Type 571 dry weight	lb.	$0.50	
60	lb.	.60	
Neoprene Type CG	lb.	.70	
E	lb.	.65	
FR	lb.	.75	
GN	lb.	.28	/ $0.30
ILS	lb.	.70	
KNR	lb.	.75	
M	lb.	.65	
Perbunan 26	lb.	.63	
Synthetic 100	lb.	.41	
"Thiokol" Type "A"	lb.	.35	
"FA"	lb.	.50	
Molding powder No. 472	lb.	.61	
1001	lb.	.75	
Tackifiers			
B.R.H. No. 2	lb.	.02	.021
Buna Tackifier 56-30	lb.	.28	/ .30
LX-433 (*tank car*)	lb.	.068	
P.H.O. (*drums*)	lb.	.24	
Plastac	lb.	.12	
TY-PLY (Q, S, and SC)	gal.	6.75	/ 8.75
Vulcanizing Ingredients			
Magnesia, light (for neoprene)	lb.	.25	/
Sulphur	100 lbs.	2.05	
Chloride (*drums*)	lb.	.04	
Telloy	lb.	1.75	
Thiogen 6	lb.	.18	/ .25
10	lb.	.18	/ .25
Vandex	lb.	1.75	
(See also Colors—Antimony)			
Waxes			
1515-A (black)	gal.	1.35	
C (clear)	gal.	1.25	
Carnauba, No. 3 chalky	lb.	.7125	
2 N.C.	lb.	.7575	
3 N.C.	lb.		
1 Yellow	lb.	.8325	
2	lb.	.8125	
Carnube	lb.	.49	/ .59
Monten	lb.	.12	/ .17
Rubber Wax No. 118.			
Neutral	gal.	.76	/ 1.31
Colors	gal.	.86	/ 1.41

RECLAIMED RUBBER

THE improvement in the quality of camelback for recapping truck and passenger-car tires to be made possible by Amendment 48 to OPA Ration Order 1A, effective August 25, which permits the use of Grade C instead of Grade F for this purpose, should lighten somewhat the demands on reclaim producers for reclaimed rubber for this purpose. Grade F was an all-reclaim camelback; while Grade C contains a portion of GR-S rubber. Reclaimers do not anticipate any reduction in the overall demand for reclaimed rubber, however, since that not used for recapping purposes will be quickly absorbed by manufacturers of other rubber products.

Ceiling prices on selected grades of natural rubber reclaim are listed in the table below:

Ceiling Prices

	Sp. Grav.	¢ per Lb
Auto Tire		
Black Select	1.16-1.18	6½ / 6¾
Acid	1.18-1.22	7½ / 7¾
Shoe		
Standard	1.56-1.60	7 / 7¼
Tubes		
Black	1.14-1.26	11¾ / 11½
Gray	1.15-1.26	12½ / 13¼
Red	1.15-1.32	12 / 12¼
Miscellaneous		
Mechanical blends	1.25-1.50	4½ / 5½
White	1.35-1.50	13½ / 14½

The above list includes those items or classes only that determine the price bases of all derivative reclaim grades. Every manufacturer produces a variety of special reclaims in each general group separately featuring characteristic properties of quality, workability, and gravity at special prices.

Fixed Government Prices*

	Price per Pound	
Balata	Civilian Use	Other Than Civilian Use
Manaos Block	$0.38¾	$0.38¾
Swinam Sheet	.42½	42½
Guayule		
Guayule (*carload lots*)	.17½	.31
Latex		
Normal (*tank car lots*)	.26	.43½
Creamed (*tank car lots*)	.26¾	.44¼
Centrifuged (*tank car lots*)	.27¾	.45¼
Heat-Concentrated (*carload drums*)	.29½	.47
Plantation Grades		
No. 1X Ribbed Smoked Sheets	.22½	.40
1X Thin Pale Latex Crepe	.22½	40
2 Thick Pale Latex Crepe	.22	.39½
1X Brown Crepe	.21⅜	.38⅞
2X Brown Crepe	.21⅛	.38⅜
2 Remilled Blankets (Amber)	.21¼	.38¾
3 Remilled Blankets (Amber)	.21⅛	.38⅜
Rolled Brown	.18	.35½
Synthetic Rubber		
GR-M (Neoprene GN)	.27½	.45
GR-S (Buna S)	.18½	.36
GR-I (Butyl)	.15½	.33
Wild Rubber		
Upriver Coarse (crude)	.12⅝	26¼
(washed and dried)	.20¾	.37¾
Islands Fine (crude)	.14⅝	28¼
(washed and dried)	.22½	40
Caucho Ball (crude)	.11⅝	.24¾
(washed and dried)	.19½	.37
Mangabiera (crude)	.08½	.19¾
(washed and dried)	.18	.35½

*For a complete list of all grades of all rubbers, including crude, balata, guayule, synthetic, and latex, see Rubber Reserve Co. Circular 17, p. 169, May, 1943, issue.

Rims Approved and Branded by The Tire & Rim Association

Rim Size	July, 1943
15" & 16" D. C. Passenger	
16x4.00E	44,705
15x4.50E	1,409
16x4.50E	7,912
16x5.00F	3,653
16x5.50F	1,127
16x6.00F	2,851
17" & Over Passenger	
18x2.15B	21,530
Military	
16x4.50CE	73,878
16x6.50CS	34,598
20x4.50CR	9,804
20x6.00CT	20,918
22x6.00CT	147
18x8.00CV	2,306
20x10.00CW	2,173
24x10.00CW	190
Flat Base Truck	
20x4.33R (6")	25,276
15x5.00S (7")	1,581
18x5.00S (7")	3,345
20x5.00S (7")	318,161
24x5.00S (7")	513
15x6.00T (8")	447
20x6.00T (8")	32,186
22x6.00T (8")	3,337
20x7.33V (9 10")	11,353
22x7.33V (9 10")	2,289
24x7.33V (9 10")	497
20x8.37V (11")	1,553
24x8.37V (11")	629
Tractor & Implement	
12x3.00D	6,962
16x3.00D	404
18x4.19F	3,225
18x5.50F	667
24x6.00S	686
24x8.00T	3,228
32x8.00T	798
36x8.00T	128
W9-24	69
W10-28	947
DW8-38	244
DW9-38	544
DW10-38	1,086
DW12-30	1,046
Cast	
24x15.00	97
TOTAL	648,499

VULCANIZED VEGETABLE OILS

—RUBBER SUBSTITUTES—

◆

Time Tested Properties

Known aging qualities
Low cost factor
Low specific gravity
Aid to mechanical processing operations
Ease of dispersion and processing
Plasticizing action
Aid to maintaining fixed hardness
Non-thermoplastic nature

◆

FOR COMPOUNDING WITH

—NATURAL RUBBER
—RECLAIMED RUBBER
—SYNTHETIC RUBBERS

Regular and Special Constructions

of

COTTON FABRICS

Single Filling **Double Filling**

and

ARMY

Ducks

HOSE and BELTING

Ducks

Drills

Selected

Osnaburgs

Curran & Barry

320 BROADWAY
NEW YORK

COTTON & FABRICS

NEW YORK COTTON EXCHANGE WEEK-END CLOSING PRICES

Futures	June 26	July 31	Aug. 7	Aug. 14	Aug. 21
Spot	.....	20.04	20.07	20.10	20.05
Oct.	20.00	19.85	19.97	19.91	19.81
Dec.	19.81	19.70	19.87	19.80	19.66
Jan.	19.68	19.60	19.80	19.75	19.63
Mar.	19.59	19.51	19.71	19.65	19.52
July	.....	.....	19.44	19.37	19.28

THE records show a listless cotton market for August. Traders cautiously awaited news of the Quebec conference and developments on the fighting fronts before moving in any direction. The indifference of buyers and sellers in transacting business reflects such other uncertainties as the amount of staple that may be headed for the loan, the effect of the prolonged dry spell on the crop, and other variable factors that may affect the marketing angle.

A cotton crop for 1943 of 12,558,000 bales of 500 pounds gross weight was forecast by the Crop Reporting Board of the Agriculture Department. This, based on information as of August 1, was 2.1% below the 1942 cotton production. In the southern sections of the Cotton Belt yields are generally better than for last year, but northern areas will probably not reach the 1942 quotas. As for weevil trouble it is even less feverish than it was last year when loss was about average. An interesting and timely note is the fact that although fertilizer costs more this year, the acres receiving fertilizer totaled 9,977,000, compared with last year 9,978,000 acres; and 312.1 pounds per acre were applied in 1943, while only 292.8 pounds per acre were used the year before. Average price of fertilizer per ton this year is $32.04, against $30.77 last.

The sharp drop in the estimate of July consumption by the New York Cotton Exchange Service Bureau was about in line with trade expectations. July consumption, approximated at 850,000 bales, was 67,000 bales under the June figures, and 144,000 bales lower than in July, 1942. This partly reflects seasonal influences, with some mills shut down for a week during July for repairs and a vacation period. Labor inadequacies also contribute to this condition. In many quarters, too, mills are inhibited against accepting new business because of the favorable war picture and the pending price control question.

Cotton farmers are not receiving parity payments since average prices on the farm plus conservation payments are higher than parity, and marketing quotas have already been lifted. The paramount cotton problem, some traders contend, is production of sufficient quantities of the high grades which are in heavy demand and scarce. The prediction of Chairman Fuller of the House Agricultural Committee that the lack of labor to harvest the crop would result in a low-grade crop with 75% of it middling grade or lower attracted floor attention. This would duplicate the situation of the past season when there was a scarcity of high-grade cotton and an overabundance of low grade.

The OPA announced new cents-per-pound ceilings for cotton linters of the 1943-44 crop, about 20% lower than current maximum current prices. The regulation applies to chemical linters and hull fibers as well as the "free" or unallocated grades. Based on the recently issued allocation of next season's crop of linters as set forth in WPB order M-12, as amended July 24, this OPA action assures substantial savings to consumers while allowing the producers, if output remains the same, to continue to realize on linters their average returns of the two preceding seasons. Linters comprise the basic raw material in the production of bleached cotton pulp, a vital war commodity used in the manufacture of smokeless powder, plastics, and in tire and parachute fibers.

The price of $^{15}/_{16}$-inch spot middling grade rose from 21.20¢ on August 2 to 21.22¢ on August 3, then dropped to 21.10¢ on August 5, rallied to 21.27¢ on August 9, and then shrank steadily to 20.77¢ on August 21, only to rise to 21.28¢ on August 30, and close at 21.21¢ on September 1.

Fabrics

Cotton tire cord manufacturers met last month with WPB officials to try to develop additional production of tire cord and to take steps to assure maximum output next year. According to Thomas M. Bancroft, chief of the Cotton Branch, Textile, Clothing and Leather Division, who presided over the meeting, the present production of cotton tire cord is on a basis of approximately 240,000,000 pounds per year, whereas present requirements are on an approximate 270,000,000 pounds basis, a deficit of 30,000,000 pounds a year. Mr. Bancroft deems it probable that requirements will increase next year. The cotton manufacturers present indicated that they could produce the increased quantities needed only if they can (1) secure additional labor, (2) reduce absenteeism and labor turnover, and (3) operate longer hours in their present plants. If this cannot be done, then the program will require additional capacity in other areas—which in turn will necessitate further consideration by the War Production Board and the cotton cord producers. Frank L. Walton, director of the Textile, Clothing and Leather Division, stated that the cotton cord program is in addition to the rayon cord production programs now authorized, which total approximately 160,000,000 pounds a year, including the 68-million pound conversion recently approved. Mr. Walton revealed that the proposed third conversion of 40 million pounds of rayon cord has not yet been acted upn by the WPB as it will probably require the construction of new plants; whereas the conversions authorized have been made in existing plants. He expressed the hope that through maximum utilization of available facilities, the full quantities of tire cord which will be needed in the war program can be produced without authorizating further conversions or constructions of any additional new plants.

There have been reports that clothing trade interests have picked up some scattered amounts of sheetings lately, in addition to the goods which have been reported sold for bag and other industrial uses. Other coarse goods ended August in a quiet fashion. Business in osnaburgs subsided. Drills and twills were relatively inactive. In ducks, scattered civilian business is reported being placed. General prospects for gradually improved supplies for civilians were seen as a result of government moves, although this improvement may be dependent on production schedules and the labor situation.

New York Quotations

August 23, 1943

Drills			
38-inch 2.00-yard		yd.	.....
40-inch 1.45 yard			.....
50-inch 1.52-yard			$0.29
52-inch 1.85-yard			.247/8
52-inch 1.90-yard			.23223 .2325
52-inch 2.20-yard			.20511
52-inch 2.50-yard			.185
59-inch 1.85-yard			.23851
Ducks			
38-inch 2.00-yard D. F.		yd.	.215 .223/8
40-inch 1.45-yard S. F.			.2975
51 1/2-inch 1.35-yard D. F.			.335
72-inch 1.05-yard D. F.			.43 .45
72-inch 17-21 ounce			.487/8
Mechanicals			
Hose and belting		lb.	.4275
Tennis			
51 1/2-inch 1.35-yard		yd.	.315
51 1/2-inch 1.60-yard		yd.	.273/8
51 1/2-inch 1.90-yard		yd.	.233/8
Hollands — White			
Blue Seal			
20-inch		yd.	.135
30-inch			.2425
40-inch			.27
Gold Seal			
20-inch		yd.	.145
30-inch			.2575
40-inch			.29
Red Seal			
20-inch		yd.	.1225
30-inch			.22
40-inch			.245
Osnaburgs			
40-inch 2.34-yard		yd.	.155/8
40-inch 2.48-yard			.143/4
40-inch 2.56-yard S. F.			.14578
40-inch 3.00-yard			.1275
40-inch 7-ounce part waste			.15
40-inch 10-ounce part waste			.213/4
37-inch 2.42-yard clean			.1525
Raincoat Fabrics			
Cotton			
Bombazine 64 x 60		yd.	.....
Plaids 60 x 48			.....
Surface prints 64 x 60			.....
Print cloth, 38 1/2-inch, 64 x 60			.08971
Sheeting, 40-inch			
48 x 48, 2.50-yard		yd.	.16200
64 x 68, 3.15-yard			.13968
56 x 60, 3.60-yard			.11944
44 x 40, 4.25-yard			.09764
Sheetings, 36-inch			
48 x 48, 5.00-yard		yd.	.08600
44 x 40, 6.15-yard			.06991
Tire Fabric			
Builder			
17 1/4 ounce 60" 28 11 ply Karded peeler		lb.	.48
Chafer			
14 ounce 60" 20 8 ply Karded peeler		lb.	.48
9 1/4 ounce 60" 10 2 ply Karded peeler		lb.	.45
Cord Fabrics			
23/5/3 Karded peeler, 1 1/16" cotton		lb.	.44
15/3/3 Karded peeler, 1 1/16" cotton		lb.	.42
12 4/2 Karded peeler, 1 1/16" cotton		lb.	.42
23/5/3 Karded peeler, 1 1/4" cotton		lb.	.44
Leno Breaker			
8 1/4 ounce and 10 1/4 ounce 60" Karded peeler		lb.	.45

COTTON GOES TO WAR

From duck used in making field hospital tents, to sheets, towels and nurses' uniforms, cotton helps protect and care for men convalescing from battle wounds. This is another and very important part of cotton's contribution to our war effort.

Because cotton fabrics can and do play such an important part in the war, supplies of our SHAWMUT HOSE and BELTING DUCK are available only to those customers meeting conditions of general preference order M-91.

WELLINGTON SEARS COMPANY
65 WORTH STREET, NEW YORK, N. Y.

BUY MORE WAR BONDS

It is a cause for gratification to us that nine of the mills we represent have been awarded the Army-Navy "E"

SHAWMUT MILL	RIVERDALE MILL
LANGDALE MILL	EQUINOX MILL
LANETT MILL	BROOKSIDE MILLS
FAIRFAX MILL	THE DIXIE COTTON MILLS
PIEDMONT COTTON MILLS	

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SITUATIONS OPEN

AN UNUSUAL OPPORTUNITY TO DO ORIGINAL research work is available for a Research Chemist or Chemical Engineer interested in securing a position with a manufacturer of essential materials located in the Metropolitan New York area. Applicant selected must be familiar with the technical aspects of tire construction and have a background of experience in the use of rubber dispersions and latex in tire cord saturating for crude and synthetic tires. State all particulars, including salary expected and draft status in first letter. Release required if now employed in essential industry. Address Box No. 639, care of INDIA RUBBER WORLD.

CHEMIST—TIRE, TUBE, OR MECHANICAL. LABoratory, control, or research. Excellent opportunity with well-established organization located in Pennsylvania. Reply all details first letter. Address Box No. 640, care of INDIA RUBBER WORLD.

CHEMIST-ASSISTANT CHIEF—OPENING IN MEdium-sized organization, either laboratory or plant. Tires and press goods. 100% defense with excellent post-war opportunity. Investigate if not now employed at your highest skill. All replies strictly confidential during all negotiations. Address Box No. 641, care of INDIA RUBBER WORLD.

PRODUCTION SUPERVISOR — TIRES, TUBES, mechanical goods. Opening for a high-grade director of plant activities. 100% defense with attractive post-war opportunity. Salary commensurate with ability. Address Box No. 642, care of INDIA RUBBER WORLD.

MECHANICAL AND MAINTENANCE ENGINEER —Tire and Tube Plant located in Pennsylvania. Reply full details, background, experience, etc., to Box No. 643, care of INDIA RUBBER WORLD.

RUBBER AND PLASTIC COMPOUNDER. MUST BE FAMILIAR with molding and extrusion, also with cost accounting. State age, experience, salary expected. Address Box No. 644, care of INDIA RUBBER WORLD.

WANTED: FACTORY MANAGER INFORMED ON COMPLETE manufacturing, Production and Procedure of Insulated Wire and Cable. Good opportunity for the right man. Our employes are familiar with this ad. Replies will be held in strictest confidence. We are a congenial organization and can offer a permanent position to the right individual. Address Box No. 645, care of INDIA RUBBER WORLD.

ELECTRICAL ENGINEER—FAMILIAR WITH RUBber factory electrical equipment. Good opportunity in medium-sized plant located in Pennsylvania. Address Box No. 648, care of INDIA RUBBER WORLD.

MOLD MECHANIC WHO HAS HAD EXPERIENCE IN PURCHASing, maintenance, and designing of heel and sole molds for position with leading manufacturer. Address Box No. 651, care of INDIA RUBBER WORLD.

WANTED: SALESMAN WITH LATEX EXPERIENCE TO HANDLE resin emulsions and synthetic latices. Mature individual capable of becoming Sales Manager. Excellent salary and bonus to qualified applicant. Address Box No. 656, care of INDIA RUBBER WORLD.

SITUATIONS OPEN (Continued)

ANALYTICAL CHEMIST. WITH EXPERIENCE IN CONTROL OF raw material used in manufacture of insulated wire. State qualifications and draft status. Salary commensurate with qualifications and experience. Position of permanent nature. Send non-returnable photo. Do not apply if engaged in war work at highest skill. Apply JOHN A. ROEBLING'S SONS COMPANY, Trenton, N. J.

PRODUCTION MANAGER AND PRACTICAL CHEMIST. ABLE to direct rubber compounding and insulating of wire. Good salary and future prospects for right party. Address Box No. 660, care of INDIA RUBBER WORLD.

MACHINE DESIGNERS ATTENTION: WELLknown manufacturer of rubber and plastics working machinery requires the services of two designers. Fine postwar program. State age, marital status, and experience. Our employes know of this. Address Box No. 661, care of INDIA RUBBER WORLD.

SITUATIONS WANTED

RUBBER MAN AND MANUFACTURER, TWENTY years in the rubber industry, with practical knowledge of mixing, compounding, and curing of wild, plantation, and synthetic rubbers, also rubber machinery and some plastics. Capable of managing or supervising all or part of plant or taking charge of research, development, and control. Available immediately. Address Box No. 649, care of INDIA RUBBER WORLD.

RUBBER CHEMIST DESIRES TO USE ABILITY TO A BETTER advantage. Extensive experience in the development, compounding, and use of synthetic rubbers. Capable of directing a compounding unit, a laboratory, or acting as technical control. Draft deferred. Address Box No. 652, care of INDIA RUBBER WORLD.

PLANT MANAGER—PROGRESSIVE AND AGGRESsive; chemical background. Experienced in modern production methods. Thoroughly familiar with current compounding practice, both natural and synthetic rubber. Good knowledge of cost estimating. Draft exempt. Excellent health. Address Box No. 654, care of INDIA RUBBER WORLD.

SALES ENGINEER—TECHNICAL GRADUATE WITH 18 YEARS' rubber plant engineering experience desires to represent manufacturer of repute in sale of their products to rubber industry. Address Box No. 657, care of INDIA RUBBER WORLD.

RUBBER CHEMIST—FAMILIAR WITH COMPOUNDING, MIXing, tubing, vulcanizing, testing and development of rubber, Buna, neoprene. Thoroughly experienced in factory routine and follow-up. Can direct the work of others. Available November first. Address Box No. 659, care of INDIA RUBBER WORLD.

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Our staff of chemists, engineers and bacteriologists with laboratories for analysis, research, physical testing and bacteriology are prepared to render you
Every Form of Chemical Service
304 Washington Street **Brooklyn 1, N. Y.**

BROCKTON TOOL COMPANY
Central Street QUALITY MOULDS FOR ALL PURPOSES **South Easton, Mass.**
THE FIRST STEP — A QUALITY MOULD

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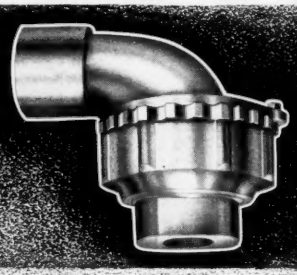
FLEXO JOINTS



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—the outstanding swing joint;
trouble free—long service.

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Complete bulletin on request.

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62 YEARS WITHOUT REORGANIZATION

BELTING
Transmission—Conveyor—Elevator

HOSE
for every purpose
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PACKING
Sheet & Rod Packings
for every condition

Mechanical Specialties of Every Description

HOME RUBBER COMPANY
Factory & Main Office
TRENTON 5, N. J.

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Stamford Neophax Vulcanized Oil

(Reg. U. S. Pat. Off.)

Factice THE STAMFORD RUBBER SUPPLY CO. Vulcanized Oil

For Use with Neoprene

THE STAMFORD RUBBER SUPPLY CO. STAMFORD CONN.

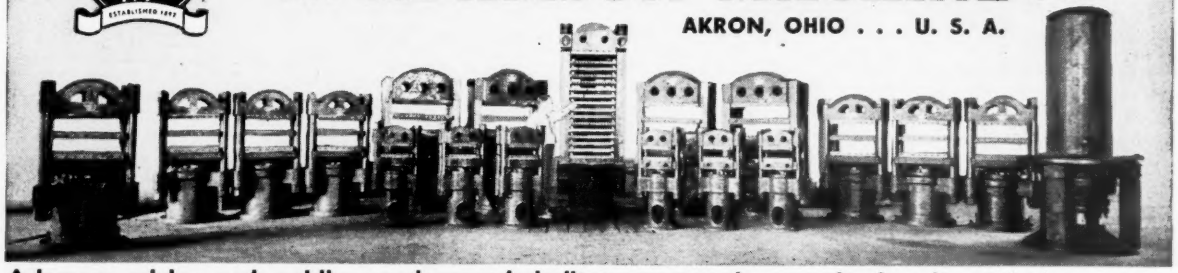
Makers of Stamford "Factice" Vulcanized Oil
(Reg. U. S. Pat. Off.)
SINCE 1900

THE WORLD'S FINEST RUBBER AND PLASTIC MACHINERY

AMCO ESTABLISHED 1872

The ADAMSON MACHINE Co.

AKRON, OHIO . . . U. S. A.



Adamson mixing and molding equipment is built to meet modern production demands for greater accuracy at lower costs. What's your machine problem? A card will bring full particulars. Write today!

Our Rebuilding Process Removes the Element of Risk

BY THESE FIVE IMPORTANT STEPS

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2. DISASSEMBLED
3. REBUILT
4. MODERNIZED
5. GUARANTEED

MACHINERY NEW & REBUILT

"Equipped to Furnish Complete Plants"

L. ALBERT & SON

OFFICES AND PLANTS

TRENTON, N. J. ★ AKRON, OHIO
LOS ANGELES, CALIF. ★ STOUGHTON, MASS.

Our New Machines

MILLS
MIXERS
CUTTERS
SAFETY BRAKES
HYDRAULIC PRESSES
SUSAN GRINDERS

New Rubber Spreaders Churns, Pony Mixers Saturators

Used—Rebuilt—Rubber—Chemical and Paint Machinery

LAWRENCE N. BARRY

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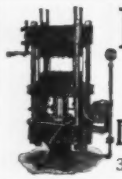

PLASTICS MOLDING PRESSES

Plain or Semi-automatic—Any Size or pressure—Pumps, Valves, etc.

Dunning & Boschert Press Co., Inc.

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AIR BAG BUFFING MACHINERY
STOCK SHELLS HOSE POLES
MANDRELS

NATIONAL SHERARDIZING & MACHINE CO.

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Representatives
Akron San Francisco New York

SPECIALIZING IN
USED MACHINERY FOR THE **RUBBER**
AND ALLIED INDUSTRIES
MILLS, CALENDERS, HYDRAULIC PRESSES,
TUBERS, VULCANIZERS, MIXERS, ETC.
ERIC BONWITT AKRON 8, OHIO

Classified Advertisements

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FOR SALE: 1—W. S. 15"x18" Hydraulic Press, 10" dia. ram; 2—D. & B. 20½x20½" platens; 1—14"x24" Press, 9" ram; 9—24"x55" Steel Cored Heating Platens; 1—26x66" 3-roll Calender; 1—Hydraulic Belt Press, 6'x30" with belt stretcher complete; 1—Farrel-Birmingham 15"x36" Rubber Mill; 4—W. & P. Mixers; Adamson 6" Tuber; Dry Mixers; Pulverizers; Grinders; etc. Send for complete list. CONSOLIDATED PRODUCTS CO., INC., 13-16 Park Row, New York, N. Y.

FOR SALE: W. & P. MIXERS, 9 TO 300 GAL.; DRIERS; KETTLES; Pumps; Pulverizers; etc. Send for Bulletins. Cash buyers of your surplus equipment. Send us your lists. BRILL EQUIPMENT COMPANY, 183 Varick St., New York 14, N. Y.

FOR SALE: 2—15"x48" RUBBER MILLS, 1—15"x36" MILL, 2—4-roll Rubber Washers, 1—2-roll Rubber Washer, 1—54" Calender, 1—60" Calender, 1 W. & P. all-bronze 2 qt. Mixer, 1—6x12 Experimental Rubber Mill, 10 new 200-gallon Rubber Churns, 2 New Rubber Spreaders, 1 New 72" Doubler, 4—7" Strainers, 2 Embossing Calenders, 1 Brushing Machine, 2 Hydraulic Presses, 1 Bonnot Pulverizer, 1 Set Steel Dry Cans. Address Box No. 655, care of INDIA RUBBER WORLD.

MACHINERY AND SUPPLIES WANTED

WANTED: SMALL HAND-OPERATED HYDRAULIC PRESS; steam-heated platens 15" x 20" approximately. Also hand-operated toggle-type press, same size. Address Box No. 647, care of INDIA RUBBER WORLD.

ONE NO. 3 ROYLE TUBING MACHINE, COMPLETE with enclosed motor-driven worm drive or with enclosed helical gears, with or without motor; one laboratory-size rubber mill; one 48" or 60" mixing mill, complete with gear reduction unit and motor. Address Box No. 653, care of INDIA RUBBER WORLD.

WANTED: BANBURY MIXER, MILLS, CALENDER, HYDRAULIC Presses, with pump and accumulator, Tubers. Any condition. Address Box No. 658, care of INDIA RUBBER WORLD.

INTERNATIONAL PULP CO.

41 Park Row, NEW YORK, N. Y.

SOLE PRODUCERS

ASBESTINE

REG. U. S. PAT. OFF.

GUARANTEED REBUILT MACHINERY

IMMEDIATE DELIVERIES FROM STOCK

MILLS, CALENDERS, TUBERS
VULCANIZERS, ACCUMULATORS

UNITED

HYD. PRESSES, PUMPS, MIXERS
CUTTING MACHINES, PULVERIZERS

UNITED RUBBER MACHINERY EXCHANGE

319-323 FRELINGHUYSEN AVE. CABLE "URME" NEWARK, N. J.

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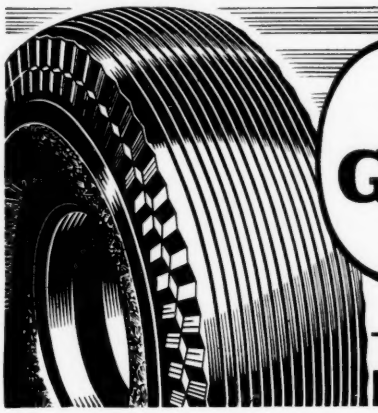

The GENERAL TIRE

Factory Control
KRAFT SYSTEM
TIRE RENEWING

–goes a long way to make friends

Look for this emblem on tires recapped by the Kraft System

KRAFT SYSTEM KRAFTIRED TIRE RENEWING

TRADE MARK REG. U. S. PAT. OFF.

THE GENERAL TIRE & RUBBER COMPANY • AKRON, OHIO

Classified Advertisements

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BUSINESS OPPORTUNITIES

WOULD BE INTERESTED IN OUTRIGHT PURCHASE OR CONtrolling interest in small- or medium-size going rubber plant anywhere—if price low enough—preferably one dipping gloves, or coating fabrics, or molding mechanicals. Replies treated in strict confidence. Address Box No. 646, care of INDIA RUBBER WORLD.

FULLY EQUIPPED PLANT WITH TWO 40" MILLS, ONE 60" calender, one 6" tuber with tread-head, complete hydraulic pumping unit, with accumulator and one 100 H.P. boiler. All equipment ready for immediate operation. Located in Metropolitan district. Building of modern construction. Owner desirous of renting complete plant. Address Box No. 650, care of INDIA RUBBER WORLD.

FACTORY REPRESENTATIVES OR BROKERS TO represent our complete line of Rubber and Plastic Machinery. A few additional territories are now open. For details address ERIE ENGINE AND MFG. CO., 953 East 12th St., Erie, Pa.

PURE GUM RUBBER SHEETING FOR SALE

Continuous 36 inches wide, .025 inch thick, 300 pounds. Sample supplied on request. Low price. Write, advising intended use and we will take up with WPB. Your priority may qualify you for purchase.

H. and A. Selmer, Inc. **Elkhart, Indiana**

Contracts and Sub-Contracts Wanted For Precision Molding

Danbury Rubber Company, Incorporated
Danbury, Connecticut

"ANNALS OF RUBBER" A Chronological Record of the Important Events In the History of Rubber

— 50c per Copy —

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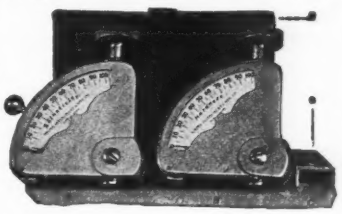
An International Standard of Measurement for—
Hardness • Elasticity • Plasticity of Rubber, etc.



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These are all factors vital in the selection of raw material and the control of your processes to attain the required modern Standards of Quality in the Finished Product. Universally adopted.

It is economic extravagance to be without these instruments. Used free handed in any position or on Bench Stands, convenient, instant registrations, foolproof. *Ask for our Descriptive Bulletins, and Price List R-4 and R-5*

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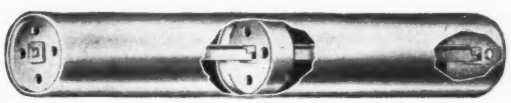
Van Wyck Ave. and Carll St., JAMAICA, NEW YORK
Agents in all foreign countries.

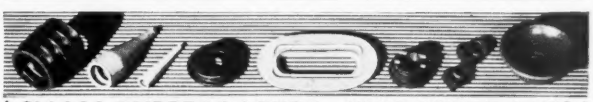
NEW AND BETTER GAMMETER'S
ALL STEEL ALL WELDED CALENDER STOCK SHELL



4" 5" 6" 8" 10" 12" diameters, any length.
Besides our well known Standard and Heavy Duty Constructions, we can supply light weight drums made up to suit your needs.

THE W. F. GAMMETER COMPANY
CADIZ, OHIO

GRANULATED CORK
FOR EXTENDING RUBBER
SOUTHLAND CORK COMPANY
P. O. BOX 868 NORFOLK, VA.



SMALL RUBBER PARTS for WAR CONTRACTS
BLOWN • SOLID • SPONGE
FROM NATURAL, RECLAIMED, AND SYNTHETIC RUBBER
THE BARR RUBBER PRODUCTS COMPANY SANDUSKY OHIO

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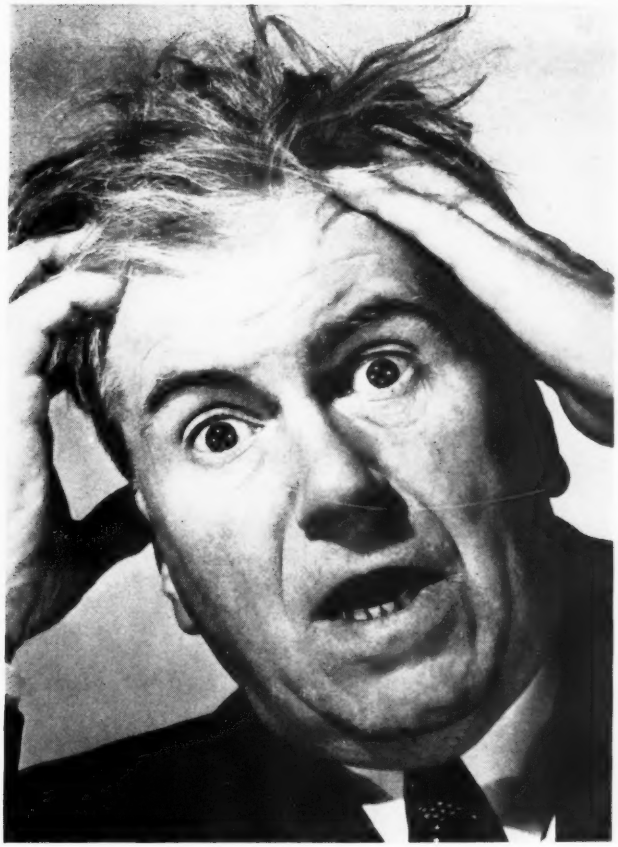
MURDER

he says!



THIS reclaimer's trouble is Scrambled Scrap Rubber. His reports make it pretty plain that when synthetic scrap gets mixed in with natural scrap . . . or with another type of synthetic . . . it's MURDER.

In polite language, such a mixture won't reclaim properly.

So we of the Scrap Rubber Organization, and you of the manufacturing industry, must follow a new set of rules when handling this scrap. Each type must be kept separate all the way from the scrap box to the final shipment. Natural rubber scrap and the various types of synthetic scrap must be labeled and baled individually.

Please do your part by segregating and classifying all your synthetic scraps at the source. We would be happy to advise or assist in any way we can, if you will notify our nearest office.

☆ ☆ ☆ ☆

Akron 9, Ohio . . . 790 East Tallmadge Avenue
East St. Louis, Illinois . . . 14th and Converse Streets
Boston 16, Massachusetts . . . 738 Statler Building
New York 18, New York . . . 500 Fifth Avenue

Buying Agent, Rubber Reserve Company

A. Schulman Inc.

SCRAP RUBBER

THE LEADING PROCESSED LINER FOR OVER 22 YEARS

CLIMCO Processing has stood the test of time and many changes in the rubber industry. Soon after its introduction in 1922 the Climco treatment was acknowledged as the best method of processing liners. Today it is still unrivaled in popularity.

Climco's success is not difficult to explain. This tough, flexible glaze applied to the liner guarantees better separation and banishes stock adhesions. Thus it saves: (1) repairs due to sticking and tearing, (2) constant cleaning between trips to the calender, (3) rerolling for cooling. Climco reduces labor and power costs, and also lengthens the life of the liner.

Today you can't afford to take a chance with your liners. Protect them with processing of *proven* quality. Have your liners "Climcoed."

THE CLEVELAND LINER & MFG. CO.
CLEVELAND, OHIO

THE CLEVELAND LINER & MFG. CO. CLIMCO CLEVELAND, OHIO, U.S.A.

LINERETTE
INTERLEAVING PAPER
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO PROCESSED LINERS

FOR FASTER, BETTER PRODUCTION AT LOWER COST